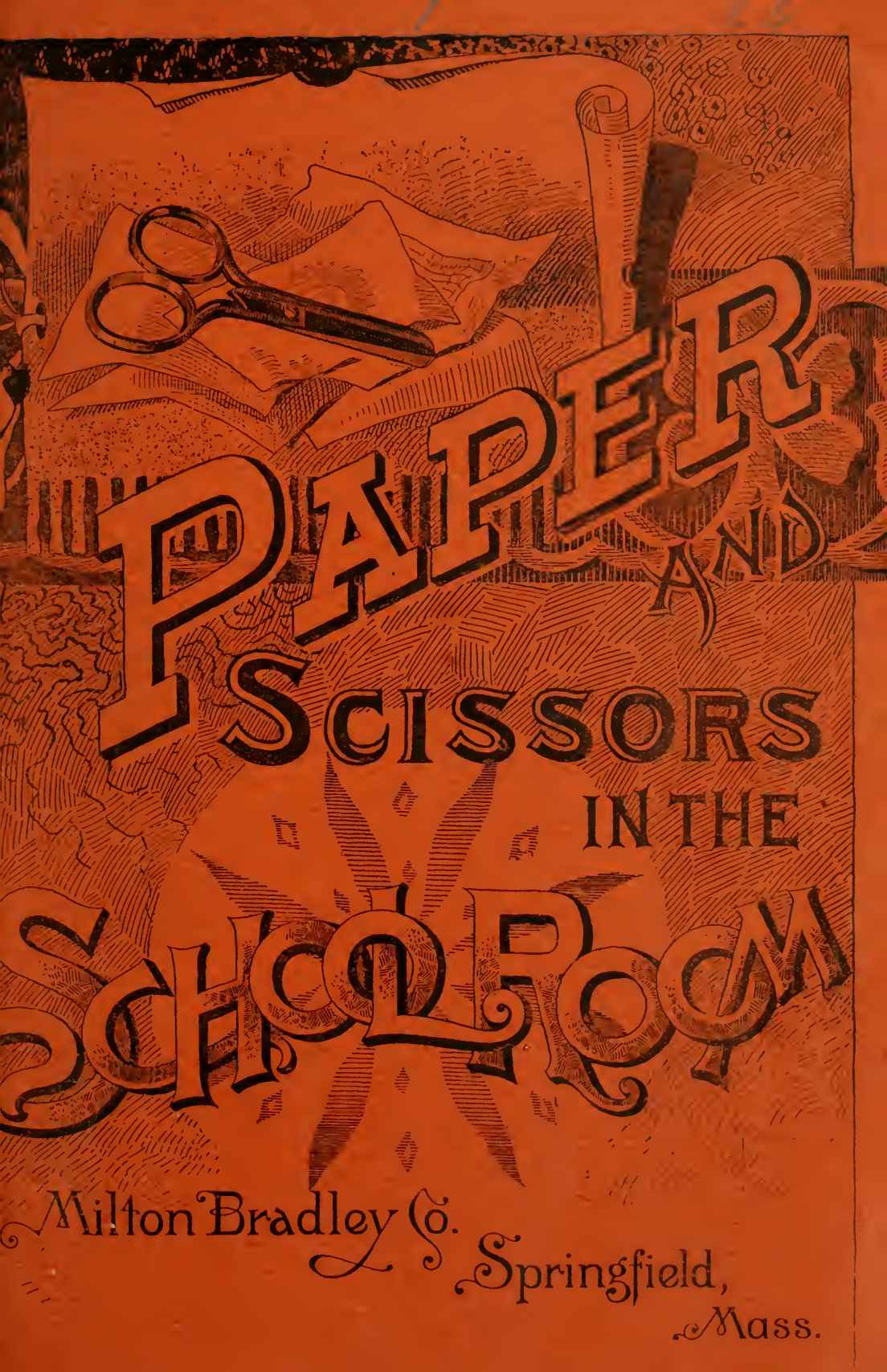


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An orange-toned illustration of school supplies. A pair of scissors is open and positioned over a piece of paper. A ruler is placed vertically to the right of the scissors. The background is filled with a dense, textured pattern of lines and dots.

PAPER AND SCISSORS IN THE SCHOOLROOM

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Mass.

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PAPER AND SCISSORS

IN THE

SCHOOLROOM.

BY

EMILY A. WEAVER.

MILTON BRADLEY COMPANY,
SPRINGFIELD, MASS.



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PREFACE.

This book is planned to give a practical and systematic course in paper folding and cutting for all grades in the public and private schools. The work begins with the simple foldings adapted to the first year in school and enlarges its scope to give cutting suited to higher grade work. Many teachers in the primary grades wish to use the paper folding taught by kindergartners, but never having had the training are at a loss to know how or what to teach, or where to find help. The first chapter of this book gives this help and the forms folded are named for the familiar forms with which the children are acquainted. Then follow five series of six each, of ornamental forms. These are not all illustrated as they follow in regular order the folding given for the first series, and full directions for those are given.

The second chapter contains a sequence of plane geometrical figures and symmetrical figures formed of them. The use of the six primary colors is here introduced, one color being confined to a series. All the figures are folded from the square, and a review in folding and comparison is placed at the beginning of each series and the dotted lines indicate the foldings to be made. Each figure folded follows directly upon the folding of the preceding one. The gain to a class in being able to follow correctly the dictation given to secure any of the forms can hardly be over estimated. The teacher also gains in her ability to give a direction clearly, concisely, and hold the class exactly to the work in hand. In order to do this a teacher must have taken and must thoroughly understand each step, or pupils and teachers will quickly be lost. If the work is carelessly given by one and carelessly done by the other no good and

much hurt is done. Correctly done the gain is apparent in every line of school work.

The third chapter is devoted to *cutting* the Geometric figures and useful and ornamental forms based upon them.

Full directions are given, but several are sometimes based upon one form, and unless each step is carefully mastered the worker may find herself unable to proceed. If studied carefully in order, all difficulties will vanish and the work be plainly understood. Most of the forms are made by one cut of the scissors, excepting the more complicated derived forms.

The requests from hundreds of teachers who have received the directions orally that are here given, the increasing demand for instruction in this line, and the feeling that it will answer the question—"Where can I get a book on Paper Cutting and Paper Folding?"—has led to the preparation of this work.

With the wish that it may prove a help to many teachers and a pleasure to many pupils, it is most heartily dedicated to you, my fellow teachers.

EMILY A. WEAVER.

PAPER FOLDING.

CHAPTER I.

Teach right and left edges, upper and lower edges, upper right and left corners, lower right and left corners. The paper is to be kept in one position on the desk and turned only when so dictated. The position of the paper should be with edges perfectly vertical and horizontal as it lies in front of the pupil. It is not deemed necessary to give full dictation lessons for every figure. A teacher following out the work will easily see the regular order and after doing the folding herself will be able to dictate a much better lesson than can be written. Dotted lines indicate creases.

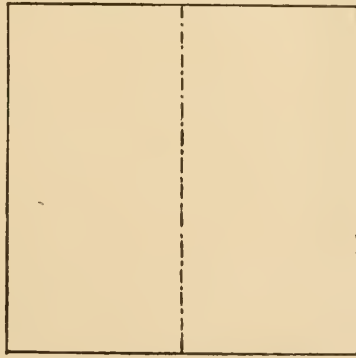


Fig 1. Book, Screen and Mat.

Book.—Fold the right edge of a square to the left edge, having the upper corners touching, and crease. From this, when opened, the child can read from memory the new word of that day's lesson.

Screen.—Stand the folded square half open on the desk. Let the child tell a story of what is behind the screen.

Door Mat or Rug.—Leave the square folded. Teach diameters, horizontal and vertical position.

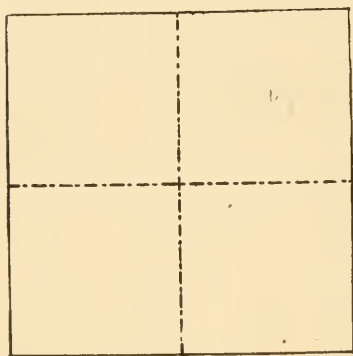


Fig. 2. Window.

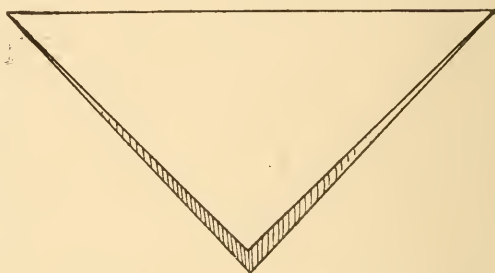


Fig. 3. Shawl.

Four-Pane Window.—Fold a square on both diameters and open.

Shawl.—Fold the lower right corner of a square to the upper left corner. Crease and leave unopened. Teach diagonal.

Snowplow.—Fold both diagonals of a square and leave them folded. Open the last half-way and stand on the edges of the square. Teach bisection or halves quadrisection or quarters.

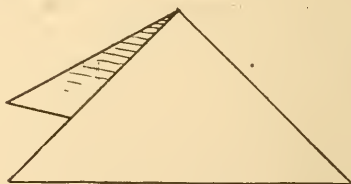


Fig. 4. Snowplow.

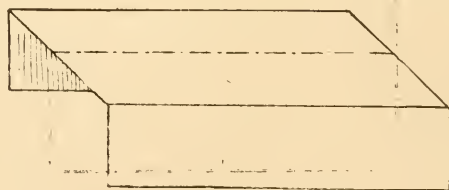


Fig. 5. Picnic Table.

Picnic Table.—Fold the horizontal diameter of a square and open. Fold upper and lower edges to meet at the diameter. Crease and open half-way. Stand on the long edges of the oblongs at top and bottom for the table.

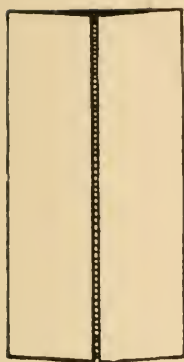


Fig. 6.
Window, with Blinds.



Fig. 7. Singing Book.

Singing Book.—Fold the horizontal diameter of a square. Fold the lower edge of the oblong to the upper edge and crease. Fold the right edge to the left edge and crease.

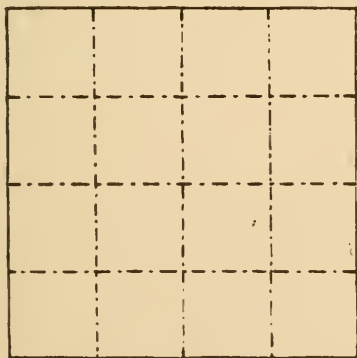


Fig. 8. Kindergarten Table Top.

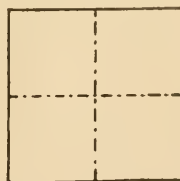


Fig. 9. Footstool.

Kindergarten Tabletop.—Fold for the window with blinds and open. Make the same folds horizontally thus obtaining sixteen small squares.

Footstool.—Fold for the window with blinds. Fold the bottom edge even with the top edge and open. Fold the top and bottom edges to the center fold and crease. Open the last folds half-way and stand on the desk. The small oblongs are the supports of the footstool.

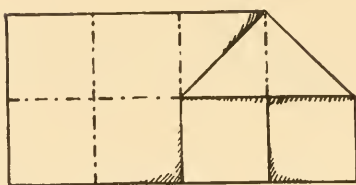


Fig. 10. Barn.

Barn.—Fold the kindergarten table top and open. Bring the lower right corner of the square up to the lower right corner of the small upper left corner square, crease a diagonal fold through the small square, the second from the top on the right-hand row of squares and open. Bring the upper right corner of the large square down to the upper right corner of the lower left corner square, and crease a diagonal fold through the small square the second from the bottom on the right-hand row of squares. Open and fold the horizontal diameter. Place the paper with the folded edge for the upper edge of the oblong. Fold the small lower right square over on the one next to it at the left and the square above it and the one at the right of it will fold on the creased diagonals.

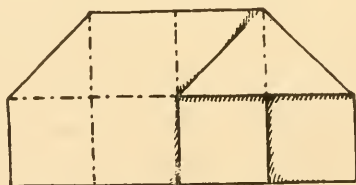


Fig 11. House.

House.—Make the foldings for the barn and repeat on the left side by folding the upper and lower left corners, so as to obtain diagonals in the small left squares corresponding to those on the right. Fold back the lower left corner square as the lower right one is folded and return it to its first position, leaving the squares above it folded inside on the creased diagonals. This will give the slant of the roof.



Fig. 12. Shelf.



Fig. 13. Shelf.

Shelf.—Fold for the house, but turn back the right lower corner square also, thus making half of each short side slant. Fold half-way down on the horizontal long fold and hold against a book or desk, as in Fig. 13.

Bench — Fold for the house with the exception of omitting to return the lower left corner square to its former position. Fold the lower edges of the two small lower squares at the center, even with the upper edge of the oblong and crease. Fold the squares and half-squares on the right and left so as to meet at the center, crease and without opening them draw half-way down the small center squares previously folded to the upper edge to form the seat. Stand upon the desk.

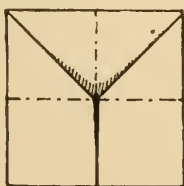


Fig. 14. Bench.



Fig. 15. Chair.

Chair.—Fold a kindergarten tabletop and fold down the right-hand row of squares and then fold as for bench. The bench and chair are the same except in length.

In the following forms one of two foldings is made. They are called Ground Form A and Ground Form B:

Ground Form A.—Fold the diameters and the diagonals of a square. Fold each corner to the center and do not open.

Fold the new corners under to the center and do not open. Ground Form A shows four squares on the upper side and eight triangles on the under side.

Ground Form B.—Fold the diameters and the diagonals of a square. Fold the right and left edges to the vertical diameter. Crease and open. Fold the upper and lower edges to the horizontal diameter, crease and open. We now have the diagonals and the square folded into sixteen small squares. Turn the paper over and fold the corners to the center and open. Turn the paper over again. Bring the middle of each edge to the center and press each corner of the square down at the center also. This now shows one large square on the under side and four small ones on the upper side.

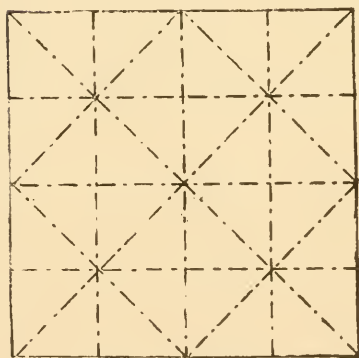


Fig. 16. Tablecloth.

Tablecloth.—Fold Ground Form A, place with four squares uppermost, and open as follows: Turn out the four corners underneath, turn back the other four corners and the folds will fall in place showing a large square for the center, and the corners falling as from the corners of a table.

Cake Basket.—Fold the tablecloth and turn it over that the squares may be the bottom of the basket. Pinch each corner together closely that it may retain a definite shape.

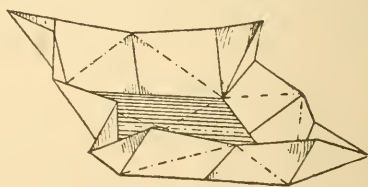


Fig. 17. Cake Basket.

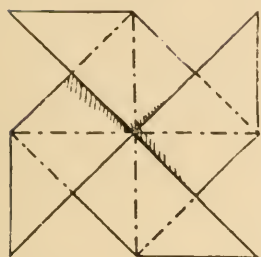


Fig. 18. Windmill.

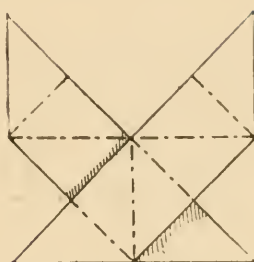


Fig. 19. Cardcase.

Windmill.—Fold Ground Form B, but in place of pressing corners to center bring each corner out and press flat.

Cardcase.—Fold the windmill and fold back on the diagonal of the square at the back.

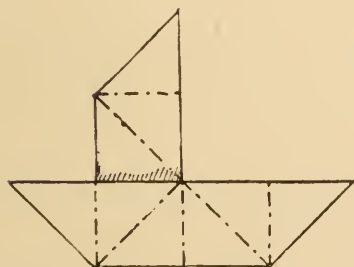


Fig. 20. Sailboat.



Fig. 21. Double Boat.

Sailboat.—Fold the cardcase and fold back one of the triangles that makes the base of the cardcase.

Double Boat.—Fold for the windmill, but instead of turning corners out, fold the upper and lower left corners toward each other, and the same with the right. Fold the square at the back together on its horizontal diameter.

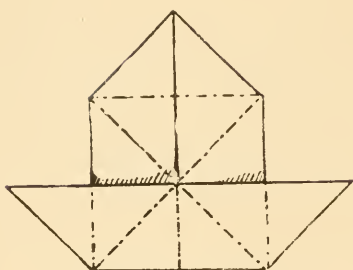


Fig. 22. Boat with Two Sails.

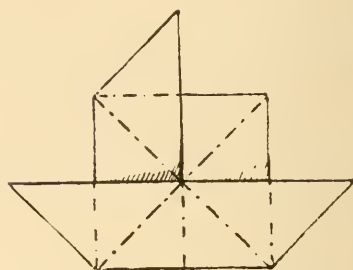


Fig. 23. Sailboat with Cabin.

Boat with Two Sails.—Fold for the double boat and fold upwards the right and left corners of the upper half of the figure.

Sailboat with Cabin.—Fold boat with two sails and fold down and back one triangle at the top of one sail.

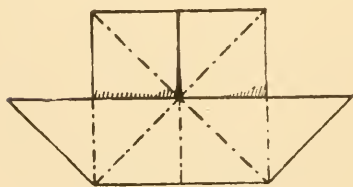


Fig. 24. Cup and Saucer.

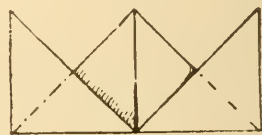


Fig 25. Crown.

Cup and Saucer.—Fold the boat with two sails and fold down and back both the triangles at the top of sails.

Crown.—Fold Ground Form A, and open. Place the square on the desk with a diagonal vertical. Fold the upper and lower corners to center. Fold the lower edge thus obtained to the upper edge and hold firmly together between the thumb and finger at the middle of the two folded edges. Fold the front upper corners down to the middle of the lower folded edge in front, and the back upper corner to the middle of the edge at the back. This brings the extreme right and left corners up even with the corners now made at the middle of the top.



Fig. 26. Boy's Hat

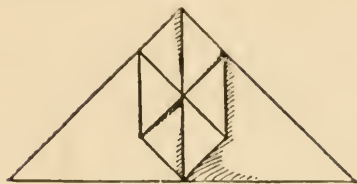


Fig. 27. General's Hat

Boy's Hat.—Fold the crown and fold back the upper right and upper left corners to the lower right and lower left corners.

General's Hat.—Fold one diameter of a square, open and turn the paper over. Fold one diagonal, open and fold the other. Take the square at the ends of the diameters and bring them together backwards, with the outside of the fold touching. Press down together the front and back triangles. Place on the desk with the long edge of the triangle at the base and horizontal. Fold the right and left corners of the upper triangle to the apex and crease. This gives two triangles meeting at their long sides, forming a square in the center of the large triangle. Fold the right and left corners of this oblique square to the center.

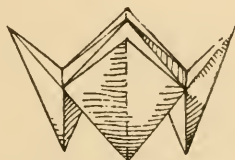


Fig. 28. Workbasket.

Workbasket.—Fold Ground Form A. Hold with the four squares in front. Bring the lower right corners backwards to the upper left corners; hold firmly in the thumb and finger and press the two remaining squares closely together. This gives a square in front and back, with one at each side, folded inside.

Hold closely by the lower corners and raise the four squares by their upper and free corners, thus forming pockets for the basket. The basket will stand easily on the four lower corners.

Ornamental Frames.—In this series of foldings, the creases are indicated by a broken line, consisting of dashes and

dots alternating like the following: — · — · — · — · ; while the full lines indicate the outer and folded edges, giving the form of the figure made, and lines made by a succession of dashes, thus, — — — — —, indicate corners folded under; these can be easily distinguished by their shape and position. The drawings are reduced to one-half size. The entire number of this series is given, and only a part of each of the others, as after the first form of each is obtained, the others follow in same order as in the first series.

FIRST SERIES, BASED ON GROUND FORM A.

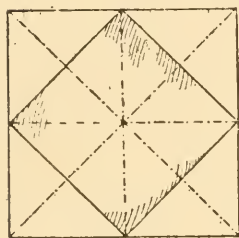


Fig. 29.

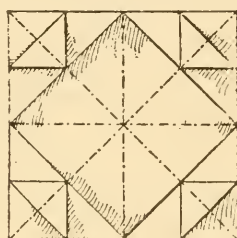


Fig. 30.

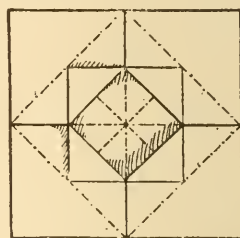


Fig. 31.

Fig. 29.—Fold the Ground Form A, then fold back to the outer corners of the square the corners which meet in the center. This leaves an open square in the center.

Fig. 30.—First, fold Fig. 29. Then fold the square corner of each triangle to the middle of its base line.

Fig. 31.—Fold Fig. 30, and then unfold the half-squares, leaving their corners folded under.

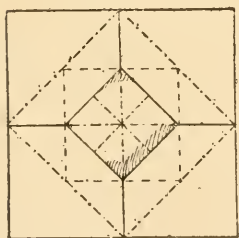


Fig. 32.

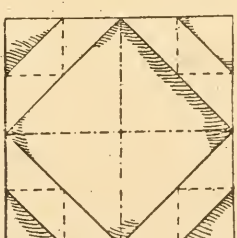


Fig. 33.

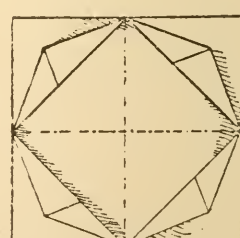


Fig. 34.

Fig. 32.—Fold Fig. 29 and unfold the corners back to the center; fold them back to the middle of the creased diagonal.

Fig. 33.—Fold Fig. 32, then fold back on each creased diagonal.

Fig. 34.—Fold Fig. 29. Fold the upper edge of the upper left half-square evenly with the base of the triangle; then fold the left edge of the same triangle even with the same base line. Fold each succeeding half-square in the same way, taking care to have the small triangle formed by the last fold alternate with its neighbor.

SECOND SERIES, BASED ON GROUND FORM B.

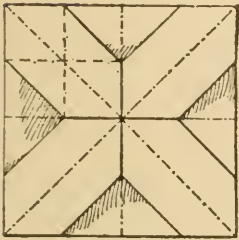


Fig. 35.

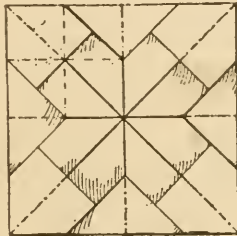


Fig. 36.

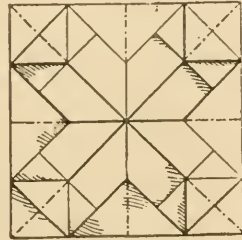


Fig. 37.

Fig. 35.—Fold the Ground Form B, then fold the two opposite outer corners of each square back underneath to the center or to the middle of the diagonal of each.

Fig. 36.—Fold the Ground Form B, then fold the inner corners back, as in No. 29 of the first series. Complete the figure by folding the opposite outer corners of each square under to the middle of the diagonal, as in Fig. 35.

Fig. 37.—Fold the Ground Form B. Fold the corners at center back to the corners of the square. Fold these corners back to the center of the creased diagonal and complete by folding the opposite outer corners under, as in the two previous figures.

A little study of the first series will suggest how other modifications of this series can be made.

THIRD SERIES, BASED ON GROUND FORM B.

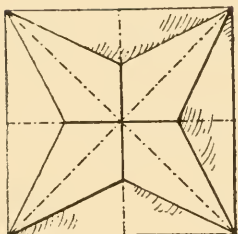


Fig. 38.

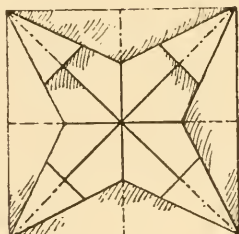


Fig. 39.

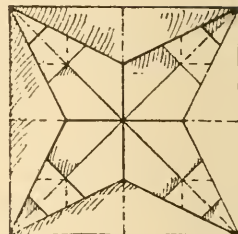


Fig. 40.

Fig. 38.—Fold Ground Form B, and fold the outer edges of each small square under to the diagonal of its square, having the sharp corner at the outer corner of the square. This gives a four-pointed star folded upon a square as the back ground.

Fig. 39.—Fold first for Ground Form B. Then fold the center corners back to outer corners as in Fig. 29 of first series, and proceed as in Fig. 38 of this series.

Fig. 40.—Fold Ground Form B. Then fold as in Fig. 33 of first series and proceed as in Fig. 38 of this series.

Other forms may be developed in this series by studying the different modifications made in the first series.

FOURTH SERIES, BASED OF GROUND FORM B.

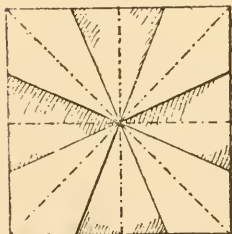


Fig. 41.

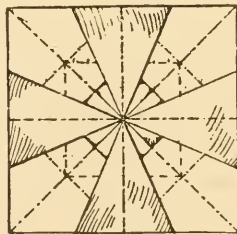


Fig. 42.

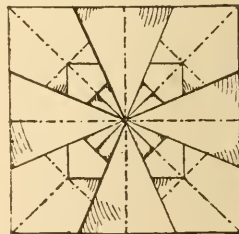


Fig. 43.

Fig. 41.—Fold Ground Form B, and fold underneath the inner edges of each square to touch along their whole length the diagonal of their square. This gives a figure like Fig. 29 of third series reversed, as now the sharp corners meet at the center, and the square corners are at the corners of the large square.

Fig. 42.—Fold the Ground Form B. Then fold for Fig. 31 and complete as in Fig. 41 of this series.

Fig. 43.—Fold the Ground Form. Then fold as in Fig. 33, and the folds of No. 41 of this series complete the form.

Fig. 43.—After the Ground Form is made, fold for Fig. 32 first series, and complete as in the first form of this series.

FIFTH SERIES, BASED ON GROUND FORM B.

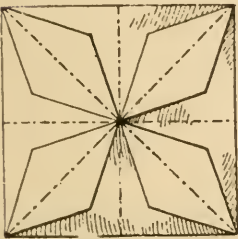


Fig. 44.

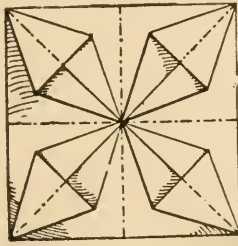


Fig. 45.

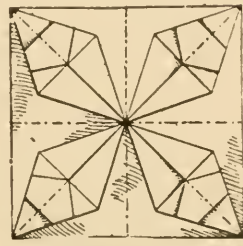


Fig. 46.

Fig. 44.—Fold Ground Form B, then fold for Fig. 38, third series, and then without unfolding, fold Fig. 41 of fourth series. This gives four diamonds meeting at the center of the square.

Fig. 45.—Fold the Ground Form and develop Fig. 29 of the first series. Then fold as in Fig. 44 of this series.

Fig. 46.—This figure is developed from Ground Form B, folded as in Fig. 30 of the first series. Complete by folding Fig. 44 of this series.

Any of the forms of the first series which have not been developed in the three figures of this series can easily be brought out by a little study of the first series.

CHAPTER II.

This chapter consists of sequences of plane geometrical forms and symmetrical figures formed by them. The geometrical forms require folding and the symmetrical figures made by them are simple arrangements of a number of the forms. In

developing the different sequences, the six standard colors are used in their spectrum order. Hence it appears that the new features introduced into this chapter are arrangement and color. A number of specimen dictation lessons are given under the first three sequences, to which special attention is directed. Similar dictations are applicable to all lessons, but it is thought better for a pupil to fold a Ground Form from memory after the idea has once been grasped, and then the forms should be developed with as few directions as possible.

Sequences of plane geometrical forms and symmetrical figures formed by them.

SEQUENCE A, SQUARES. COLOR, RED.

- | | | |
|----|---|---------|
| 1. | One single square 2-inch in size, ... | Fig. 47 |
| 2. | A large square from four 2-inch squares, ... | " 48 |
| 3. | Inclose a 2-inch square, ... | " 49 |
| 4. | Inclose a 1-inch square, ... | " 50 |
| 5. | Squares repeated forming a border, ... | " 51 |
| 6. | Squares repeated alternating position for a border, ... | " 52 |

SEQUENCE B, OBLONGS. COLOR, ORANGE.

- | | | |
|----|---|---------|
| 1. | One single oblong 2-inch x 1-inch in size, ... | Fig. 53 |
| 2. | Form a large oblong, using four small oblongs, ... | " 54 |
| 3. | Inclose a 2-inch square, ... | " 55 |
| 4. | Make a square of four oblongs enclosing a 1-inch square, ... | " 56 |
| 5. | Oblongs touching at corners, the short sides enclosing a 1-inch square, ... | " 57 |
| 6. | Oblongs touching at corners enclosing a 1-inch x 2-inch oblong, ... | " 58 |
| 7. | Oblongs repeated forming a border, ... | " 59 |

SEQUENCE C, TRIANGLES. COLOR, ORANGE.

- | | | |
|----|--|---------|
| 1. | One single triangle, ... | Fig. 60 |
| 2. | Form a large right-angle triangle, using four small triangles, ... | " 61 |

- | | | | |
|----|---|------|----|
| 3. | Incise a right-angle triangle, using three triangles, | Fig. | 62 |
| 4. | Form a 2-inch square, | " | 63 |
| 5. | Incise a 2-inch square, | " | 64 |
| 6. | Form an oblong, | " | 65 |
| 7. | Ornamental form (a windmill), | " | 66 |
| 8. | Triangles repeated for a border, | " | 67 |

(D) RHOMBOIDS. COLOR, YELLOW.

- | | | | |
|----|--|------|----|
| 1. | Comparison of square, oblong, triangle, rhomboid. | | |
| 2. | Form a large rhomboid, using four small rhomboids, | Fig. | 70 |
| 3. | Incise a 2-inch square, | " | 71 |
| 4. | Incise a rhomboid, | " | 72 |
| 5. | Rhomboids repeated, forming a border, | " | 73 |

(E) TRAPEZIUM. COLOR, GREEN.

- | | | | |
|----|--|------|----|
| 1. | Comparison of square, oblong, triangle, rhomboid, trapezium. | | |
| 2. | Incise a trapezium, | Fig. | 76 |
| 3. | Incise a small square, | " | 77 |
| 4. | Ornamental form, a star by having square corners at center, using four trapeziums, | " | 78 |
| 5. | Ornamental form, sharp corners to center, using four trapeziums, | " | 79 |
| 6. | Sharp corners to center, using eight trapeziums, | " | 80 |

(F) RHOMBUS. COLOR, BLUE.

- | | | | |
|----|---|------|----|
| 1. | Comparison of square, oblong, triangle, rhomboid, trapezium, rhombus, | | |
| 2. | Form large rhombus, using four small rhombs, | Fig. | 83 |
| 3. | Incise a rhombus, | " | 84 |
| 4. | Sharp corners to center, using four rhombs, | " | 85 |
| 5. | Sharp corners to center, using eight rhombs, | " | 86 |
| 6. | Rhombs repeated for a border, | " | 87 |

(G) IRREGULAR PENTAGON. COLOR, VIOLET.

1. Comparison of square, oblong, triangle, rhomboid, trapezium, rhombus, irregular pentagon, . . .
2. Inclose a square, ... Fig. 90
3. Sharp corners meeting in center, using four pentagons, ... " 91
4. Sharp corners meeting in center, using eight pentagons, ... " 92
5. Inclose a regular pentagon, ... " 93
6. Inclose a regular hexagon, ... " 94
7. Inclose a regular octagon, ... " 95

(H) REGULAR HEXAGON. COLOR VIOLET.

1. Comparison of square, oblong, triangle, rhomboid, trapezium, rhombus, irregular pentagon, hexagon.
2. Inclose a hexagon, using six hexagons, . . . Fig. 98
3. Inclose an octagon, using eight hexagons, . . . " 99

Sequence A.—The unit for this first sequence consists of squares developed in the color red. Any size of square can be used, although a two-inch square is recommended as a convenient size to use in all the following work.



Fig. 47.

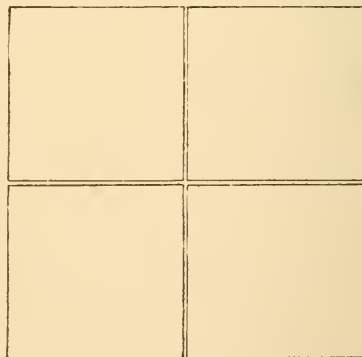


Fig. 48.

Fig. 47.—Fold for the window as in Fig. 2, a 4-inch square, and separate exactly on the folds.

Fig. 48.—One large square is formed from four small ones. These should first be laid carefully, the edges just meeting. The arrangement may be made permanent by pasting neatly.

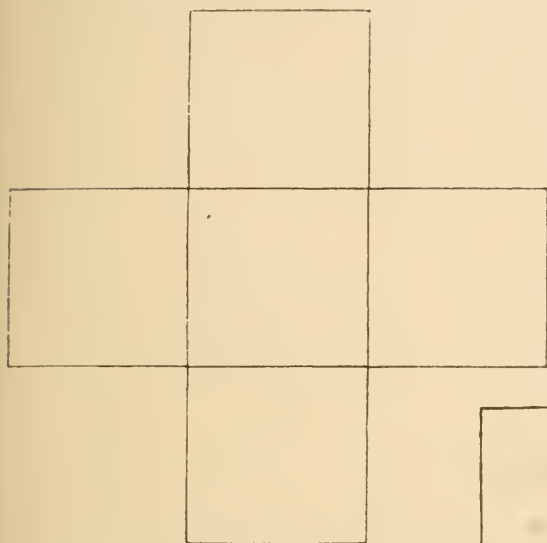


Fig 49.

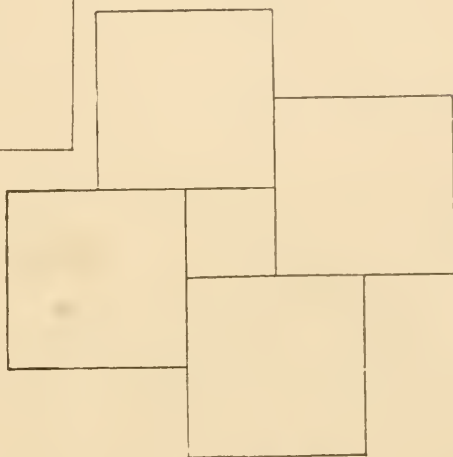


Fig. 50.

SPECIMEN DICTATION LESSON.

Fig. 49.—In this figure we have a simple arrangement of four squares repeated to enclose a square of the same size as the units.

Place a square on the desk (or paper) with two sides horizontal. Place another square with its upper right hand corner touching the lower left hand corner of the first square and its right edge vertical. Place a square in the same position, having its upper left hand corner touch the lower right hand corner of the first square. Place a fourth square with its upper corners touching the inner lower corners of the left and right hand squares.

Fig. 50.—In this arrangement we have the units repeated to inclose a square one-half the size of a unit.

Place a square with its sides vertical and horizontal. Place a second square with its upper right-hand corner in front of the middle of the front edge of the first square and edges touching. Place a third square at the right of the first with its upper left corner at the middle of the right side of the first and edges touching. Place a fourth square at the right of the second square with left edge touching this square and the upper edge the base of the third square.

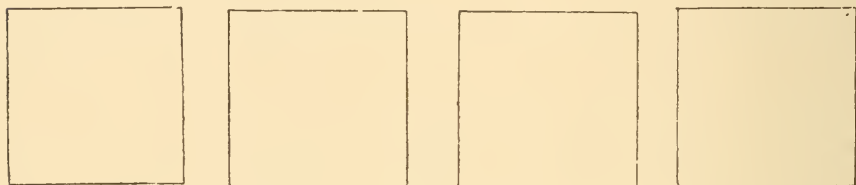


Fig. 51.

Fig. 51.—This figure illustrates still further the principle of repetition, the units being repeated to form a border.

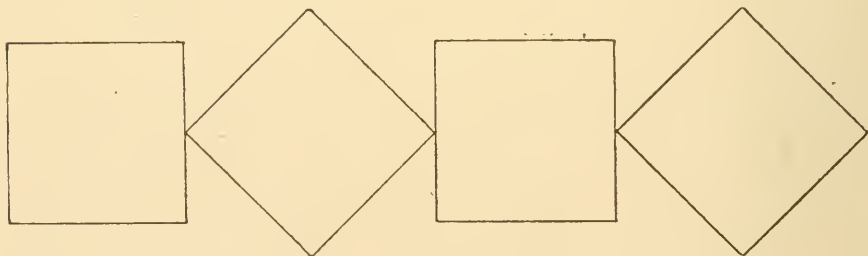


Fig. 52.

Fig. 52.—This border repeats the units and alternates their position, thereby illustrating another principle of design, namely, that of alternation.

Sequence B.—Bi-section of the square. Use standard orange color. In studying the oblong, compare it with the square.



Fig. 53.

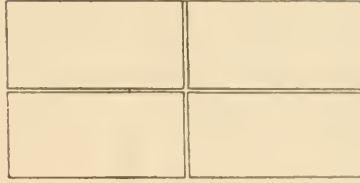


Fig. 54.

Fig. 53.—Fold a 2-inch square on one diameter. Each new form is obtained by an added fold to the preceding. The review by comparison as each is being folded accompanies the folding and development of the new form.

Fig. 54.—Fold four oblongs and place them with their edges just touching, so as to form a large oblong.

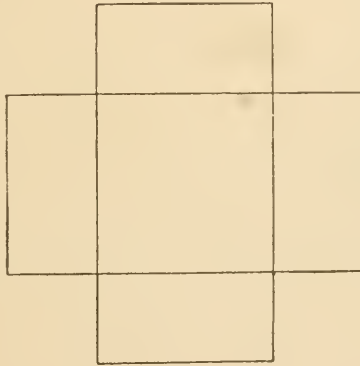


Fig. 55.

Fig. 55.—Arrange oblongs to enclose a 2-inch square.

SPECIMEN DICTATION LESSON.

Fig. 56.—Arrange four oblongs so as to inclose a square, each side of which is equal to the short side of the oblong. Place an oblong with its long sides horizontal. Place a second with one short side touching the front or lower side of the first and its left side in a line with the left side of the first. Place a third oblong with its long sides vertical, and touching the right side of the first oblong, the upper sides forming one hor-

izontal edge. Place a fourth oblong at the right of the second, touching right edge of this and front edge of the third, and having its long sides horizontal.

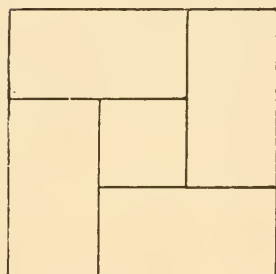


Fig. 56.

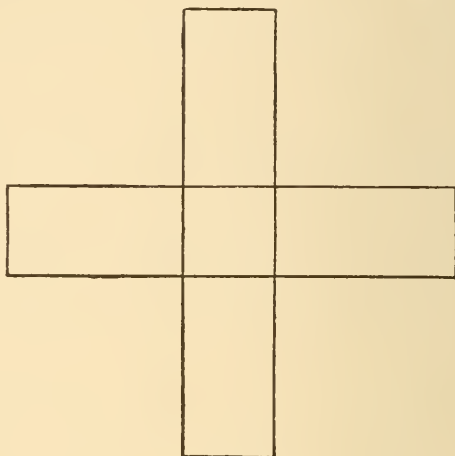


Fig. 57.

Fig. 56.—Arrange four oblongs so as to inclose a square the size of the short side of the oblong.

Fig. 57.—Arrange four oblongs, touching at the corners, so that the short sides will inclose a one-inch square.

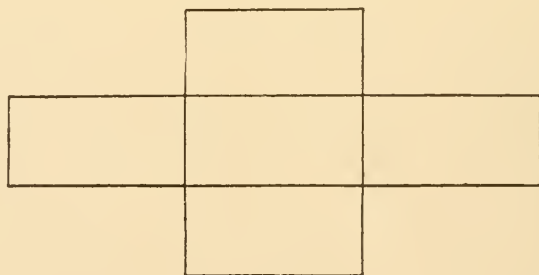


Fig. 58.

Fig. 58.—Make four oblongs and arrange them so that their corners will touch and the sides inclose an oblong the same size of the oblongs used.

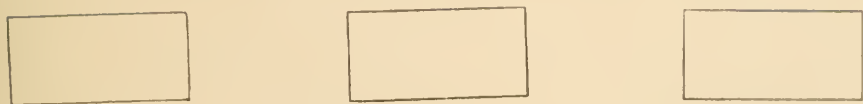


Fig. 59.

Fig. 59.—Fold a number of oblongs and repeat them in a row to form a border.

Sequence C.—Triangles form the basis of Sequence C. Bi-section of square. Commence by comparing square, oblong and triangle. Use standard orange.



Fig. 60.

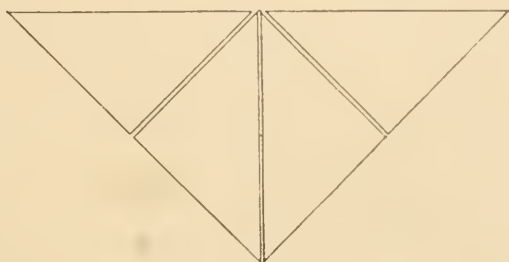


Fig. 61.

Fig. 60.—Fold a diagonal of a square. This will form a right-angle triangle.

Fig 61.—Fold four triangles. Arrange them as in the illustration, thereby forming a large triangle.

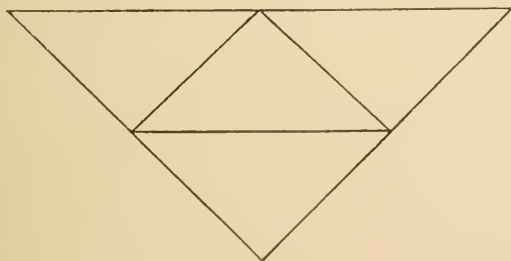


Fig. 62.

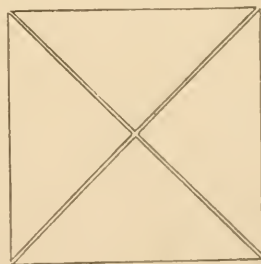


Fig. 63.

SPECIMEN DICTATION LESSON.

Fig. 62.—Form a large right-angle triangle by arranging three small right-angles triangles which will inclose a right-

angle triangle. Place a triangle with its long edge horizontal and at the back. Place a second in same position, the left corner touching the right corner of the first. Place a third in same position, the back corners touching front corners of the other two.

Fig. 63.—Form a solid square by an arrangement of four small triangles, the right angles meeting in the center.

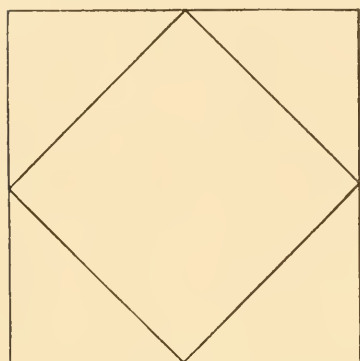


Fig. 64.

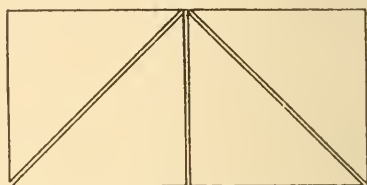


Fig. 65.

Fig. 64.—Fold four right-angled triangles from two-inch squares and arrange them so as to inclose a square.

Fig. 65.—Arrange four right-angled triangles to form an oblong.

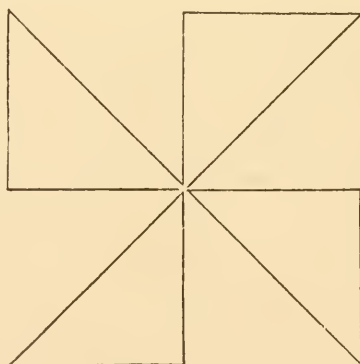


Fig 66.

Fig. 66.—Place four right-angled triangles like illustration, forming a windmill.

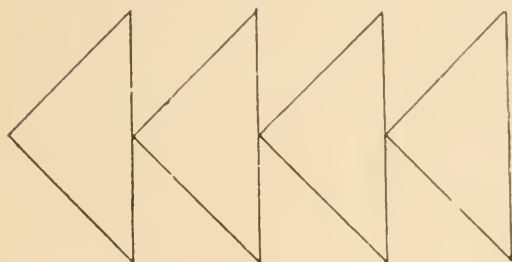


Fig. 67.

Fig. 67.—Triangles repeated as in the illustration to form a border.

Sequence D is developed from rhomboids folded from standard yellow paper. Compare the rhomboids with the three forms previously studied.

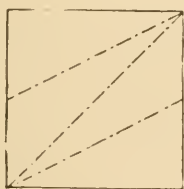


Fig. 68.

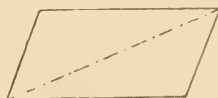


Fig. 69.

Fig. 68.—Fold a square on a diagonal, then fold opposite edges from the opposite ends of the diagonals evenly with the diagonal as indicated by the dotted lines.



Fig. 70.

Fig. 70.—Fold four rhomboids and place them in position to form a large rhomboid.

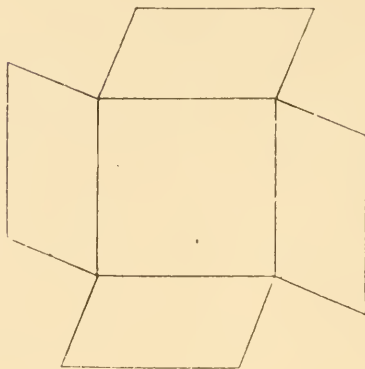


Fig 71.

Fig. 71.—Arrange four rhomboids to enclose a square the size of a long side of the rhomboids.



Fig. 72.

Fig. 72.—Arrange small rhomboids to enclose a rhomboid the same size as those used.



Fig. 73.

Fig. 73.—Repeat four rhomboids in a line like the illustration to form a border.

Sequence E consists of trapeziums made from standard green paper. Commence the study of the trapezium by comparing it with all the forms previously studied.



Fig. 74.



Fig. 75.

Fig. 74.—Fold one diagonal of a square and from one end of the diagonal fold the adjacent edges of the square evenly with the diagonal. The dotted lines indicate the creases.

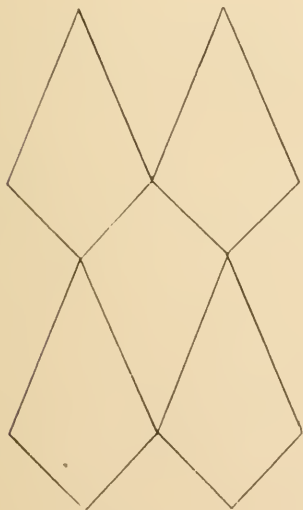


Fig. 76.

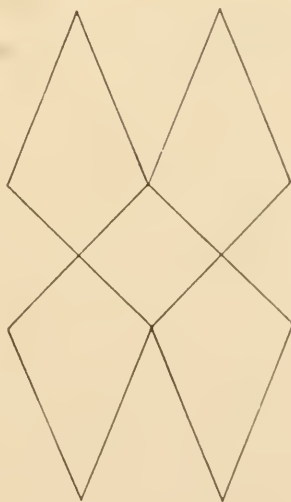


Fig. 77.

Fig. 76.—Fold four trapeziums and arrange them to enclose a trapezium of the same size.

Fig. 77.—Fold four trapeziums and place them in position so that the short sides shall form a square.

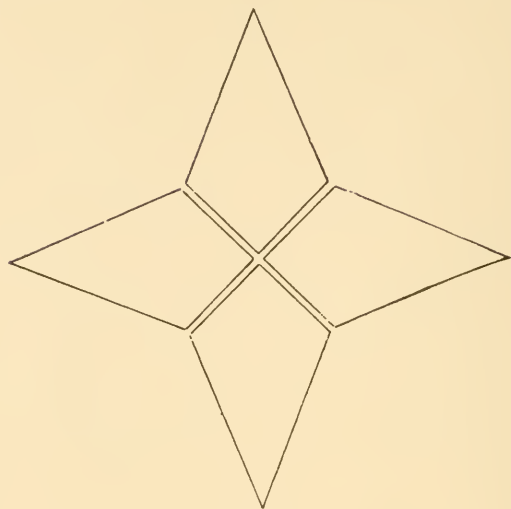


Fig. 78.

Fig. 78.—A star may be formed by folding four trapeziums and arranging them with the right angles meeting at the center.

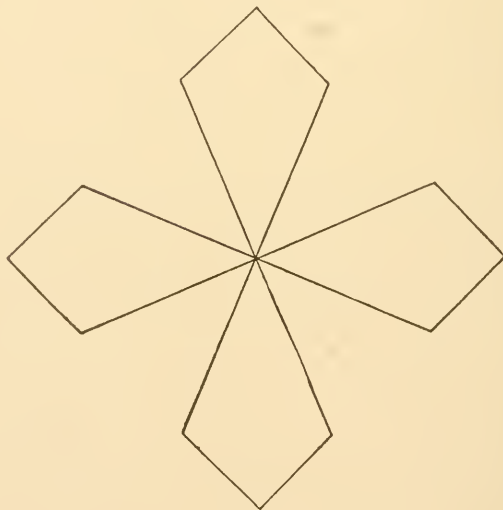


Fig 79.

Fig. 79.—Arrange four trapeziums with the acute angles meeting at the center.

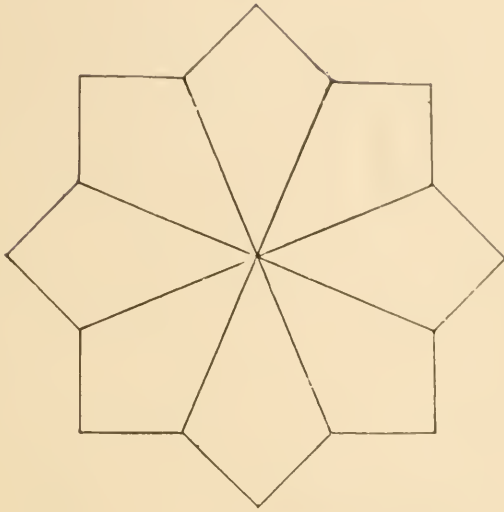


Fig. 80.

Fig. 80.—Another ornamental form is made of eight trapeziums arranged with their pointed ends to the center, forming a solid figure.

Sequence F.—is developed by the use of the rhombus worked out in standard blue color. Compare the rhombus with those forms previously studied.

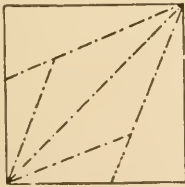


Fig. 81.



Fig. 82.

Fig. 81.—Fold a square trapezium as in Fig. 75. Then fold from the opposite end of the diagonal the other sides of the square evenly with the diagonal, as indicated by the dotted lines.

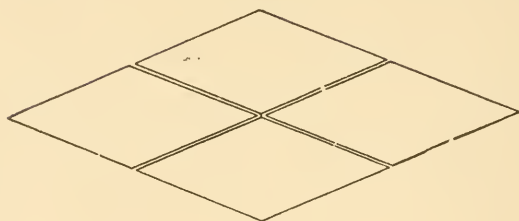


Fig. 83.

Fig. 83.—Form a large rhombus by using four small ones.

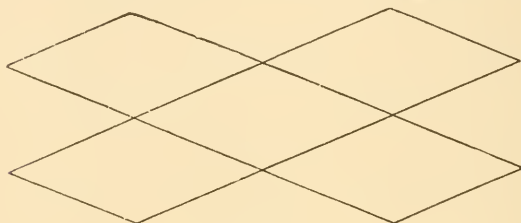


Fig. 84.

Fig. 84.—Use four small rhombs and arrange them so as to enclose a rhombus, the same size of the rhombs used by having the rhombs touching at corners.

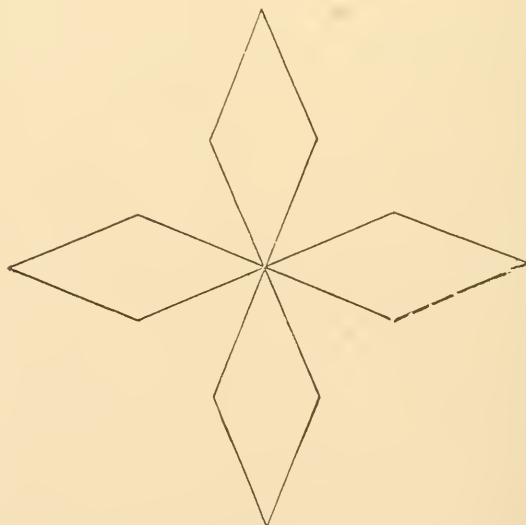


Fig. 85.

Fig. 85.—Arrange four rhombs with the four acute angles at the center.

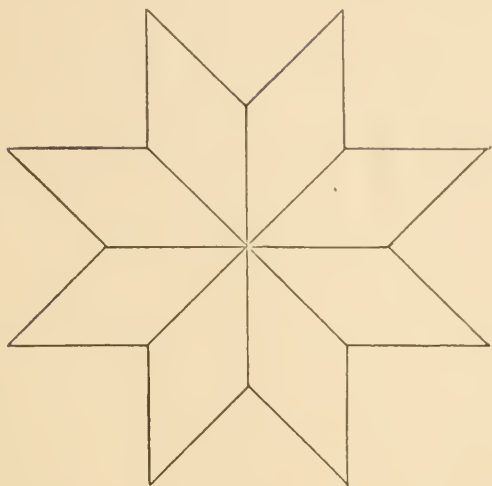


Fig. 86.

Fig. 86.—arrange eight rhombs with an acute angle of each at the center.



Fig. 87.

Fig. 87.—Repeat rhombs in a row with the acute angles touching to form a border.

Sequence G is made up of irregular pentagons folded from standard violet paper. Compare this form with all the other forms that have been taken up.

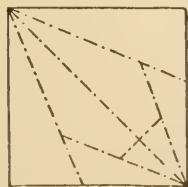


Fig. 88.



Fig. 89.

Fig. 88.—Fold the rhombus and complete by folding to just beyond the center of the diagonal one of the acute angles, and the resulting form is an irregular pentagon.

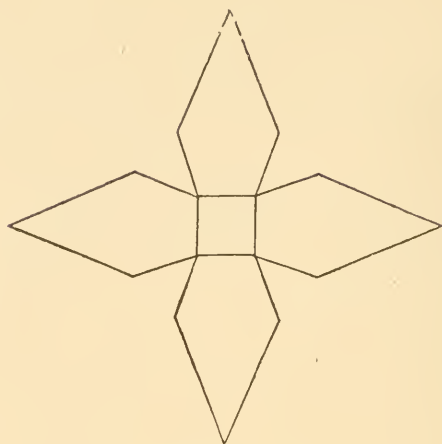


Fig. 90.

Fig. 90.—Fold and arrange four irregular pentagons around a hollow square.

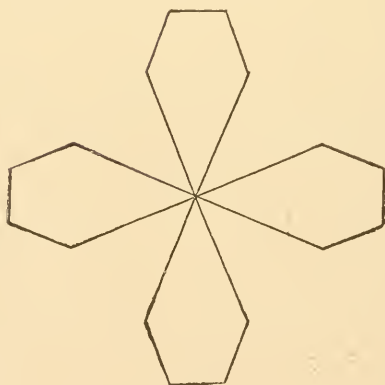


Fig. 91.

Fig. 91.—Make and use four irregular pentagons, having the acute corners meet in the center.

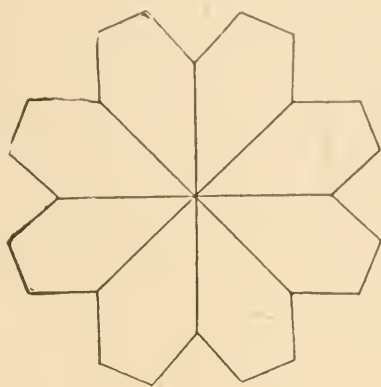


Fig. 92.

Fig. 92.—Fold eight irregular pentagons and arrange them with the acute angles meeting in the center.

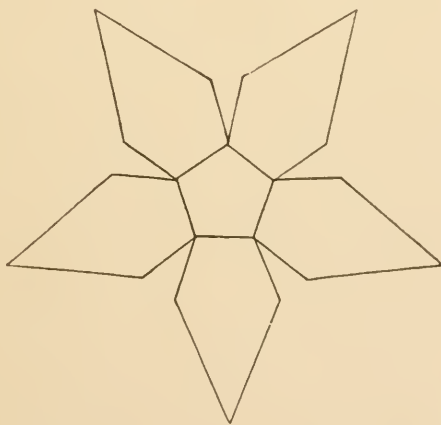


Fig. 93.

Fig. 93.—Make and use five irregular pentagons enclosing a regular pentagon.

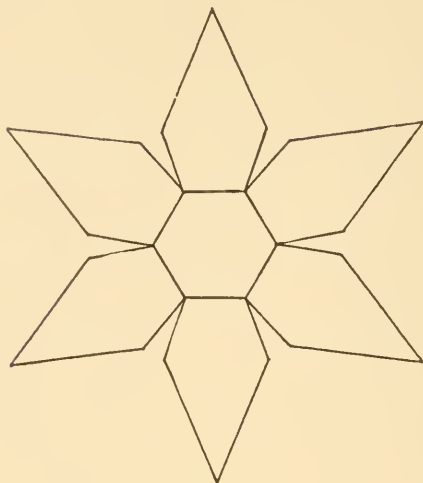


Fig. 94.

Fig. 94.—Fold six irregular pentagons and arrange them so as to enclose a hexigon.

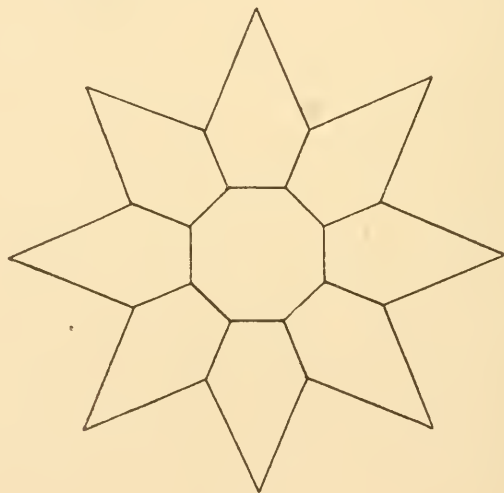


Fig. 95.

Fig. 95.—Carefully make eight irregular pentagons and use them to enclose a regular octagon.

Sequence H consists of regular hexagons folded from standard violet paper. Compare this form with those previously studied.

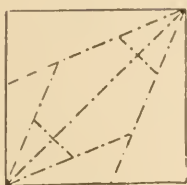


Fig. 96.



Fig. 97

Fig. 96.—Fold the pentagon on one and fold back the other acute angles to just beyond the center, thus forming a hexagon.

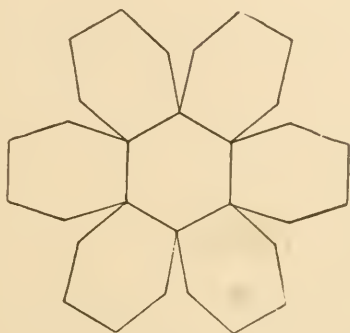


Fig. 98.

Fig. 98—Make six hexagons and arrange them to enclose a hexagon.

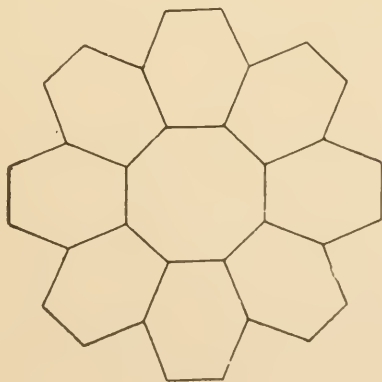


Fig. 99.

Fig. 99.—Fold eight hexagons and arrange them to enclose an octagon.

CHAPTER III.

The first two chapters required folding only, this chapter adds cutting. This work requires very careful folding, as one cut is sufficient to make the figure. At first it may be convenient after folding to sketch the line on which to cut. In this work prepared squares may be used, or those made of any required size by folding a square from an oblong sheet of paper.

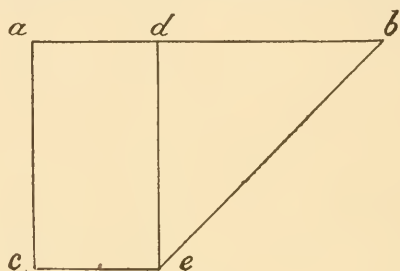


Fig. 100.

Fig. 100.—To fold a square. Take an oblong. Bring the lower right corner “d” of the oblong up to the upper edge and place the right edge of the oblong evenly along its whole length with this upper edge. Crease the oblique fold and cut off the portion of the oblong extending beyond the edge “d e.” This produces a square with one of its diagonals folded.

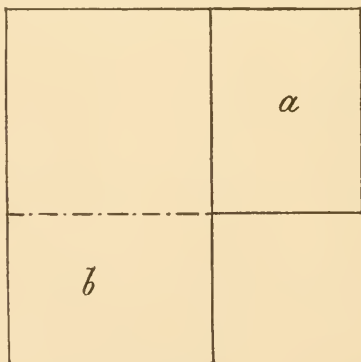


Fig. 101.

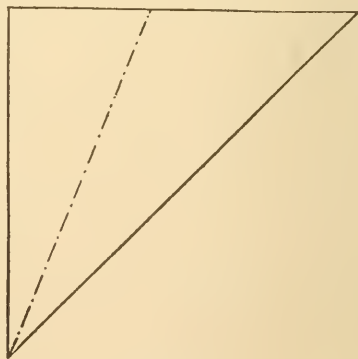


Fig. 102.

When a square without a fold is required use two oblongs of

equal width. Place one across the other so that one corner and two edges of each shall coincide; the short edges of one touching the long edges of the other. Cut off the portions of each extending beyond the other which are marked *a* and *b* in the illustration.

A right-angled triangle is simply made by folding and cutting a square on one diagonal. Fig. 102 without the dotted line illustrates a right-angled triangle.

Fig. 102.—An obtuse-angle triangle is obtained from the right-angled triangle. Fold from either acute angle of the right-angle triangle, laying a short edge evenly with the long edge of the triangle and cut on the fold.

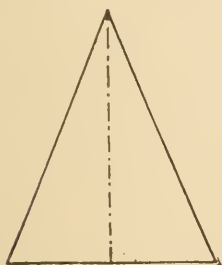


Fig. 103.

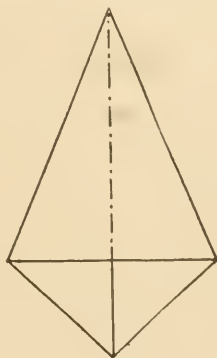


Fig. 104

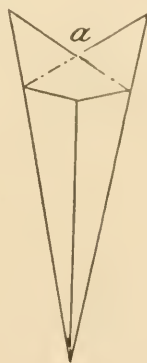


Fig. 105.

Fig. 103.—An acute-angle triangle may be made from the right-angle triangle. Place the two short sides evenly together, crease and open. Fold the two short sides down entire length along this fold and cut off the triangles folded down.

Fig. 104 and 105.—A wall pocket can be made from Fig. 103 by making the same folds, but not cutting off the side triangles. Unfold them half-way, pass one by the other, fasten them together and hang by a bow or ribbon at the point "*a*". When made of cardboard or celluloid they make an ornamental and useful case for pencils, lighters or any light articles.

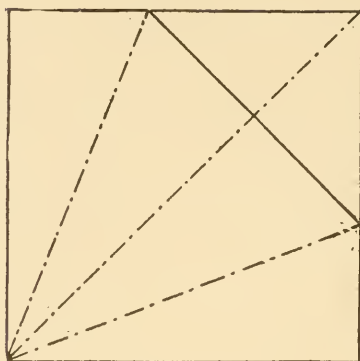


Fig. 106.

Fig. 106.—A dart or spear head. Fold a square on one diagonal and open. From the upper left corner fold the left edge of the square evenly along the diagonal. Fold lower edge of square along the same diagonal. Cut on last-made creases. The same can be obtained by leaving the diagonal folded, then folding one edge only and cut through the two thicknesses of paper at once.

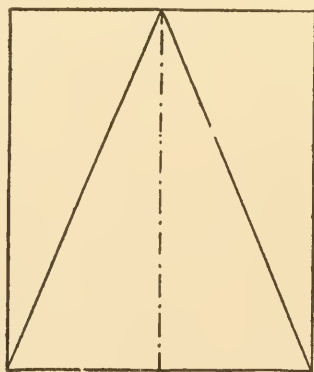


Fig. 107.

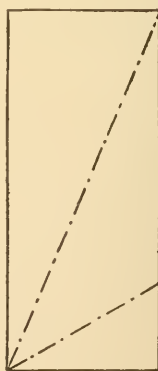


Fig. 108.

Fig. 107.—An isosceles triangle. Fold a square on one diameter. Fold the diagonal of the oblong thus obtained and cut on the last fold.

Fig. 108.—An arrow head. Fold a square on a diameter or an oblong on its long diameter. Cut the isosceles triangle. Divide the fold through the center of the triangle into fourths and cut from the lower corners of the triangle to the point one-fourth the height from the base.

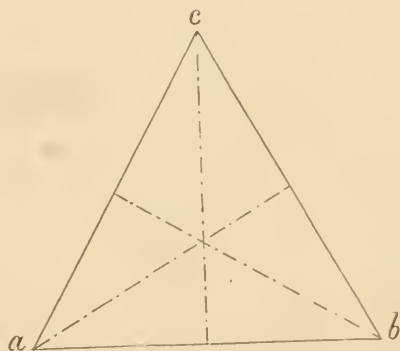
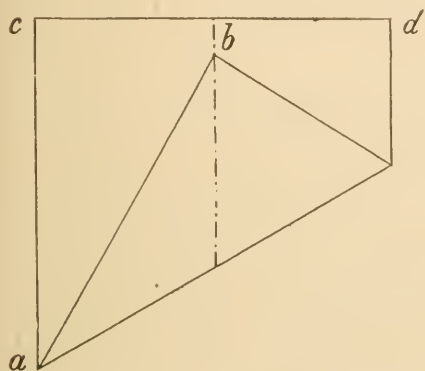


Fig. 110.

Fig. 109.—An equilateral triangle. Fold the diameter of a square or the long diameter of an oblong. This fold connects top and bottom of the square and is vertical. Open the paper. From "a" the lower left corner bring the lower edge up until the lower corner "b" touches the diameter, near the upper edge of the square. This measures the length of the base in an oblique line from "a" to the diameter. Mark this point and open. Fold or cut from this point to the corners "a" and "b".

Fig. 110.—To find the center of the triangle fold angle "b" to "c" and crease. Then fold angle "c" to "a" and crease, as shown by dotted lines in Fig. 110.

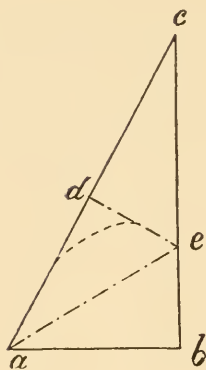


Fig. 111.

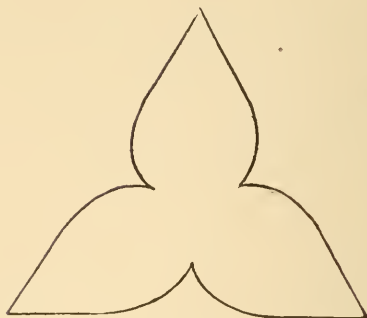


Fig. 112.

Flower forms and other ornamental forms may be easily made from modifications of the triangle.

Fig. 111.—Fold the two lower corners together and crease. This gives a right-angle triangle. Place it on the desk with the shortest side at base and the right angle at the right, the longest side towards the left. Fold the upper corner “c” to the lower “a” and crease. Fold the corner “b” back to the new point “d” as shown by the dotted lines, and the figure is like the triangle “a d e”. Draw and cut in a full curve from the middle of edge “a d”.

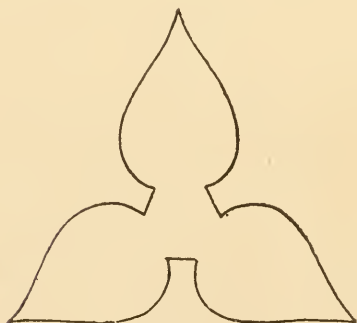


Fig. 113.



Fig. 114.

Fig. 113.— This figure shows another form that can be made by a slight variation. The triangle is folded the same as for Fig. 112.

Fig. 114.—In this figure the isosceles triangle is used and the two half circles are cut at once, but the base requires another cut. A variety of figures can be easily cut and used in designs for borders or surface covering, both from the triangle and the work which follows immediately after this. The figure can be first cut from the folding paper and used as a pattern. Trace around the pattern on the back of the colored paper and cut out, thus avoiding folds in the units to be used in the design.

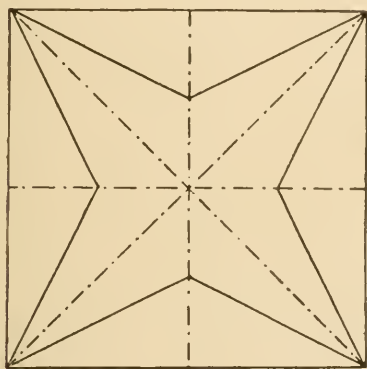


Fig. 115.

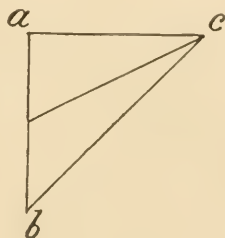


Fig. 116.

Fig. 115.—The four-pointed star: Fold a square on its diameters, open and fold one diagonal. Open. Fold on both diameters and leave folded and fold on the crease made for the diagonal. We now have a right-angle triangle. (In folding on the diagonal for the triangle in all these figures it is better to fold one side front and back, that there may not be so many thicknesses folded.) Place the triangle on the desk with the long side towards the right and the right angle "a" for the upper left corner as shown in Fig. 116. Bisect the short side of the triangle "a b" at the left. This consists of folded edges. Cut from the middle of this side to the upper right corner of the triangle "c". Unfold and the star is complete.

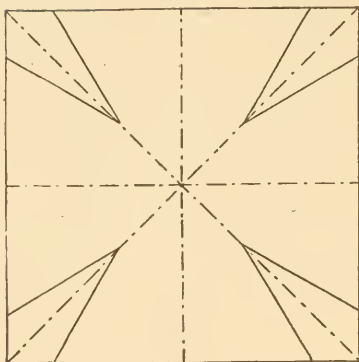


Fig. 117.

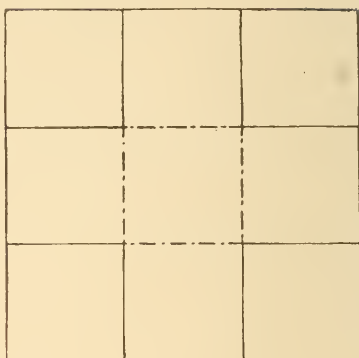


Fig. 118.

Fig. 117.—The Maltese cross: Fold as for the four-pointed star. Place the triangle in same position. Trisect the long side of the triangle marked in Fig. 116. Quadrisect the upper edge "ac" and bisect the half at the right. Cut from that point of bisection nearest the corner "c" to the lower point of trisection of the long side, nearest "b" and unfold.

Fig. 118.—The Greek Cross: Trisect each side of the square and fold to make nine small squares. Cut out each corner-square. If it be desirable to retain the square to show the method, cut only one side of each corner-square and fold the square back. When unfolded the cross is completed.

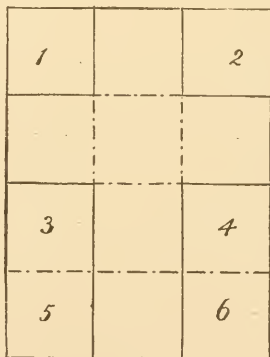


Fig. 119.

Fig. 119.—The Latin cross: Fold a square into sixteen small squares and cut off the right-hand row. This leaves an

oblong three squares wide and four squares long. Cut out the upper corner squares. Cut out the lower corner-squares and the one directly above each. This cuts out the squares marked 1, 2, 3, 4, 5 and 6, and completes the square. As in the Greek cross, if desired cut only one side of squares 1 and 2, and the top of squares 3 and 4 and fold them back. This is the better way if the paper cross is used as the subject of a drawing lesson.

Figs. 120 to 135 are flower forms and other ornamental figures cut from the square fold as for the four-pointed star.

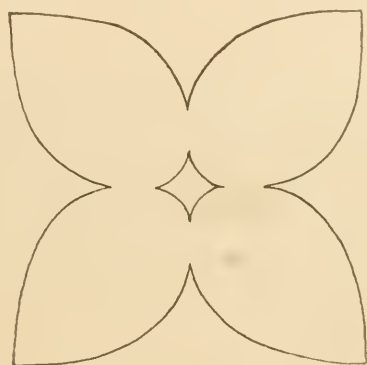


Fig. 120.

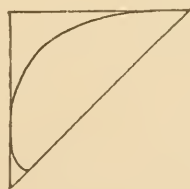


Fig. 121.

Fig. 120.— This figure illustrates the conventional form of a lilac blossom. Fold the same as for the star and then cut a full curved line as shown in Fig. 121 from "c", Fig. 116, to the point of bisection on the line "a b". Then cut a short curved line, curving toward the center and a short distance from it to form the square, with curved sides for the center.

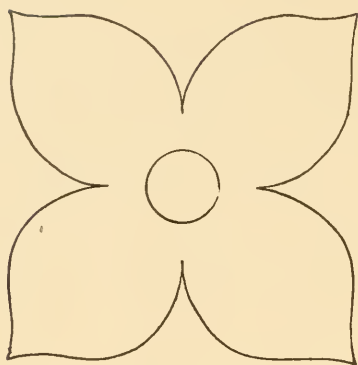


Fig. 122.

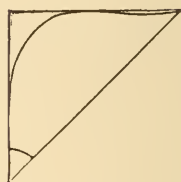


Fig. 123.

Fig. 122.— This illustrates the clematis and can also be made for the syringa. Fold for the star and cut the curve shown in Fig. 123, cutting from the corner *c* shown in Fig. 116, making the curve slightly compound near the corner and having a circle for the center. The purple clematis is very irregular, sometimes having five, six, and even seven petals.

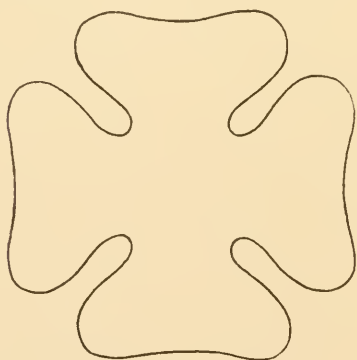


Fig. 124.

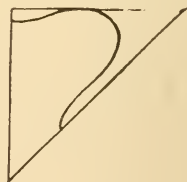


Fig. 125.

Fig. 124.—The dogwood is based upon the division of the Maltese cross, Fig. 117. Fold for the same and then draw or cut the curve which is illustrated in Fig. 125. This begins near the top of the short folded edge of the triangle.

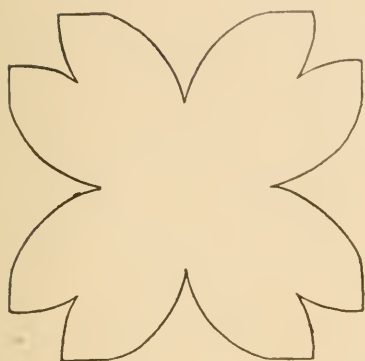


Fig. 126.

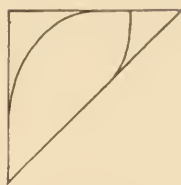


Fig. 127.

Fig. 126.—This figure illustrates an ornamental form based upon the same folding as the four-pointed star. Draw or cut the curve shown in Fig. 127, taking care that the triangle is held in the same position as shown in Fig. 116.

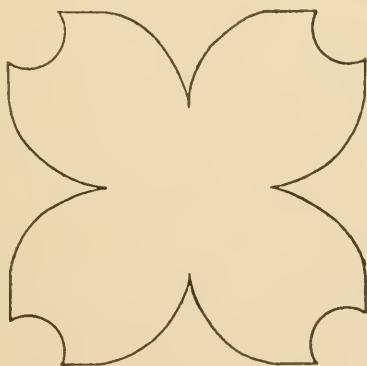


Fig. 128.

Fig. 128.—This form is another modification of the same base-form as the above, being folded from the pointed star. Then cut a full curve similar to the one in Fig. 122, except that the corner is rounded out.

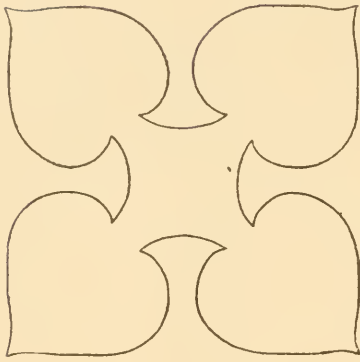


Fig. 129.

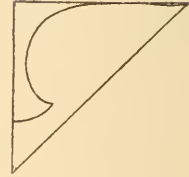


Fig. 130.

Fig. 129.—Fold as for the four-pointed star and cut the curve shown in Fig. 130.

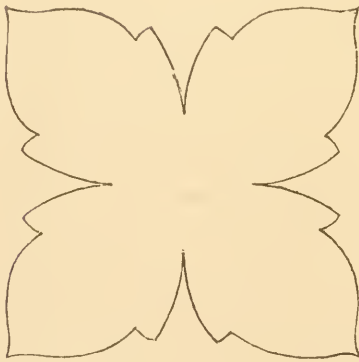


Fig. 131.



Fig. 132.

Fig. 131.— This figure is another of the ornamental designs made from the foldings of the pointed star. Draw or cut the curve as shown in Fig. 132 and unfold.

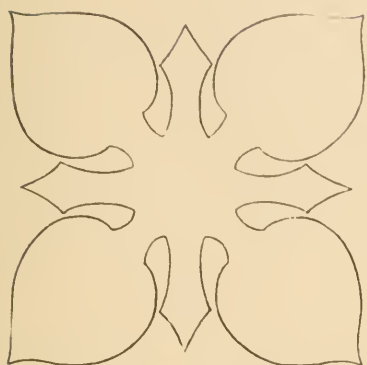


Fig. 133.

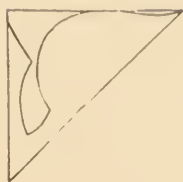


Fig. 134.

Fig. 133.—Fold as for the four-pointed star and cut the curves illustrated in Fig. 134.

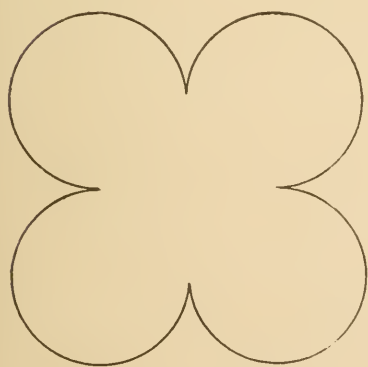


Fig. 135.

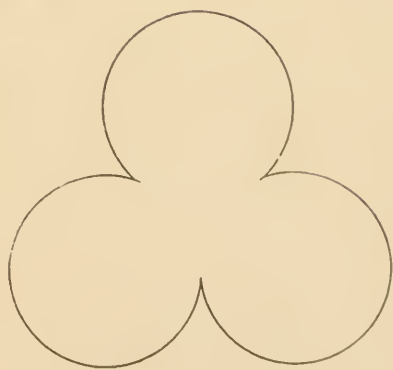
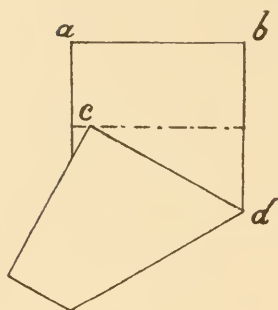


Fig. 136.

Fig. 135.—The quarterfoil is folded as for the star. Consider the base of the semicircle to be the long folded edge of the triangle, bisect this fold for the center of the circle and cut a semicircle which shall touch the middle of the two short sides of the triangle, stopping the curve at the middle of the short folded edge.



137.

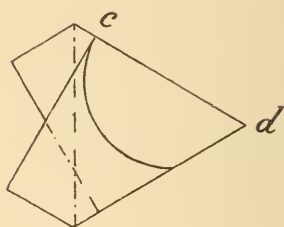


Fig. 138.

Fig. 136.—To make the trefoil, fold a square on one diameter, forming an oblong, quadrisect the fold by marking and fold down only the upper quarter and unfold the last fold, leaving the square folded on the diameter. Keep this fold on the right hand. Bring the lower half of the diameter up to touch the fold last made, one quarter from the top. The end of the lower half diameter must touch the fold near the left edge of the oblong and form a straight line from the middle of the diameter “d”, as in Fig. 137. Fold the upper portion of the oblong back evenly with the fold “c d” and cut a curve that is part of a semicircle that might be cut from this piece should it be continued beyond the fold near the center. (See Fig. 138.)

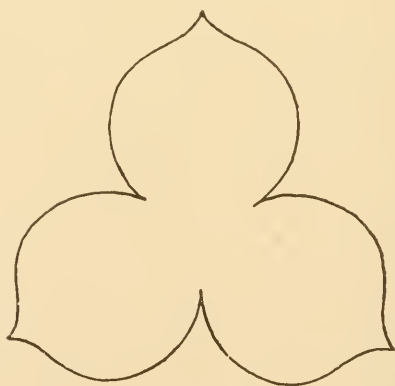


Fig 139.

Fig. 139.—A flower form may be easily cut from the trefoil. Fold as for the trefoil and then cut a compound curve as in the clematis Fig. 122.

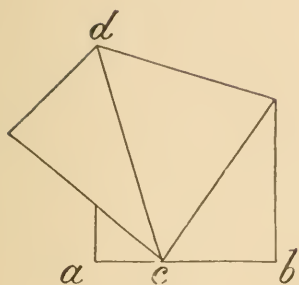


Fig. 140.

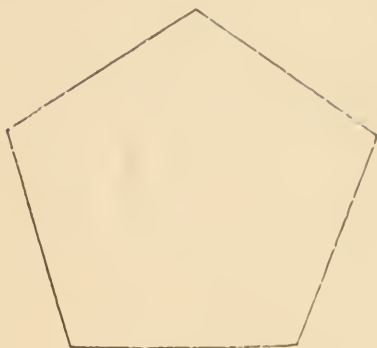


Fig. 141.

Fig. 140.—To make a pentagon : Fold a square on the vertical diameter. Keep this diameter at the right hand and vertical. Trisect the lower edge of the oblong thus made. Bring the upper end of the diameter to the point of trisection “c”, nearest the left corner of the oblong and crease the fold. Cut from this point of trisection through the four thicknesses of paper to the highest left-hand corner, or the left end of the upper folded edge marked “d”.



Fig. 142.

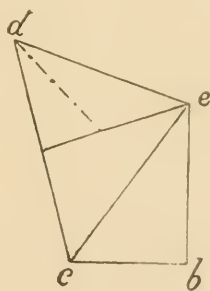


Fig. 143

Fig. 142.—To make the five-pointed star fold and cut for the pentagon and fold back the right-angle triangle “cbe” at the right even with the edge “ce”. Fold the edge “de” even with “ce” also. Hold the paper with the short folded edge “be” towards you. Bisect it and cut from the corners “c” to this point or bisection.

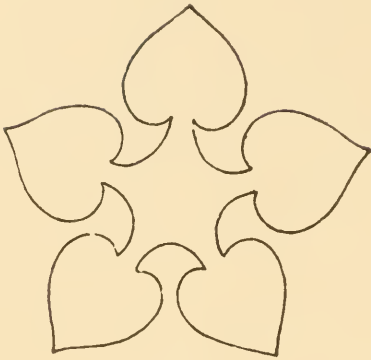


Fig. 144.

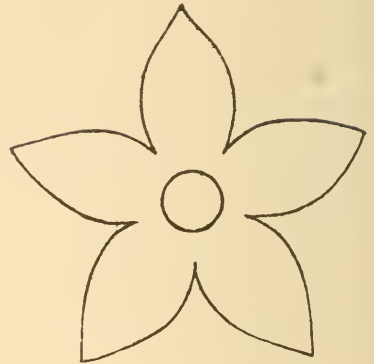


Fig. 145.

Fig. 144.—Fold and cut for the five-pointed star. Draw or cut the curves shown in Fig. 130.

Fig. 145.—The cherry (blossom) is made from the same folds and the curves are modified to the designs shown in the illustration.

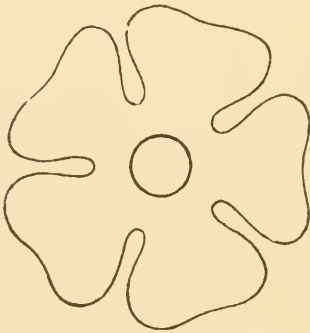


Fig. 146.

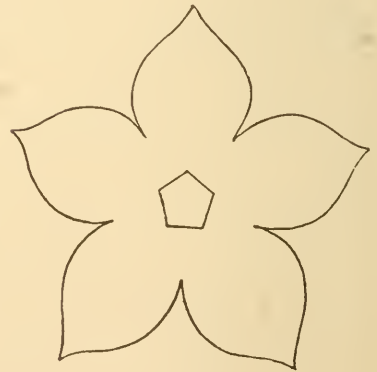


Fig. 147.

Fig. 146.—This illustrates a wild-rose design which may be made by following the above directions, and cutting to the curve shown in Fig. 125.

Fig. 147.—The phlox design is cut from the five-pointed star in the same way as either of the above designs and cutting the curve shown in Fig. 123. The same folds are used for any five-parted flower or design, varying the cut to secure the desired form.

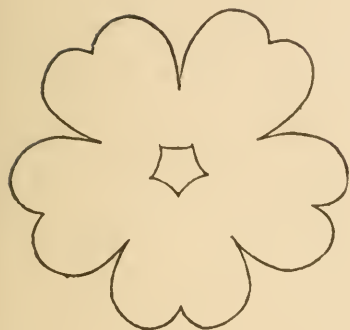


Fig. 148.

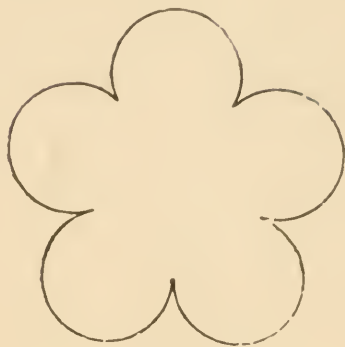


Fig. 149.

Fig. 148.—The oxalis design is folded like the five-pointed star. Then cut the curve shown in the illustration.

Fig. 149.—The cinquefoil is also based upon the folds for the star and then cut the semicircle as for the trefoil or quatrifoil.

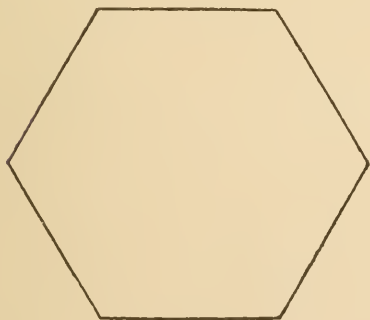


Fig. 150.

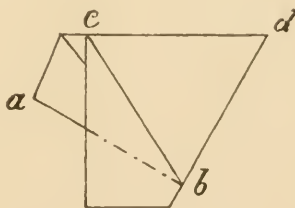


Fig. 151.

Fig. 150.—A hexagon may be folded from an equilateral triangle by folding each corner to the center. A hexagon may also be developed from a square. Fold as for the trefoil, Figs. 137 and 138. Then fold from the upper left end of the folded edge on the back marked "c" in Fig. 151 to the lower left end of the folded edge in front marked "b". Cut on this fold from "c" to "b", completing the hexagon.

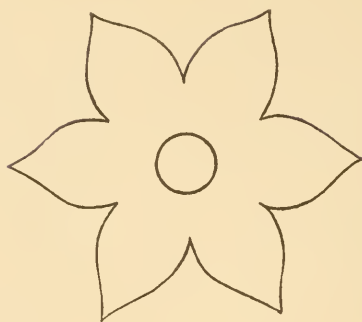


Fig. 152.

Fig. 152.—Fold and cut the hexagon, then cut the curve shown in Fig. 122. Using the hexagon as a base, the same variety of forms may be developed as were made from the four-pointed star or pentagon. The directions and illustrations for either the star or pentagon may be followed when the hexagon is used.

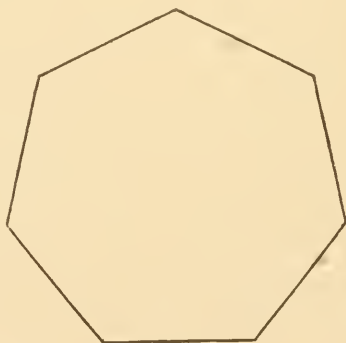


Fig. 153.

Fig. 153.—To make a heptagon fold a square on a vertical diameter. Bisect the fold and divide the upper half of the fold into fourths. Crease the fourth next the middle of the diameter, as in Fig. 154. This crease should be three-eighths of the whole length of the diameter from the top. Folding at the center "d", bring the lower end of the diameter up until it will touch a point on the folds made, and near the left end of it. This point

is marked "c" and also makes a straight oblique line from the center of the square or middle of the folded diameter marked "d".

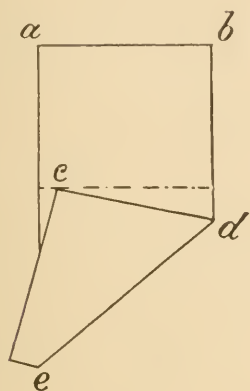


Fig. 154

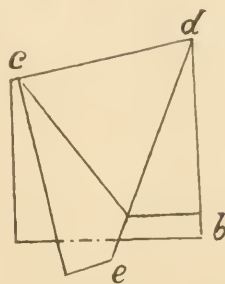


Fig. 155.

Fig. 154.—Fold back the upper part of the oblong evenly along the folded edge "c d". It is very evident the fold "c d" is shorter than "d e", hence measure the length of "c d" on "d e" from "d" and cut from that point to "c" and also horizontally across to the "b d" which has been folded down. These cuts will be the sides of the heptagon.



Fig. 156.

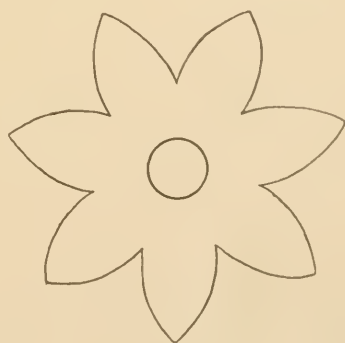


Fig. 157

Fig. 156.—To fold the even-pointed star make the folds illustrated in Figs. 154 and 155, then fold back the right-angle

triangle at the right marked "b d e". This should be one-half the width of the three portions folded together. Fold the edge "c d" evenly with the edge "d e". Turn the paper with the right angle that was folded back towards you and bisect the fold "b d". Cut from "c" to this point of bisection—as is done in the five-pointed star. Care must be taken when folding through so many thicknesses of paper to hold it securely—in order that the cuts may be even. Unfold the completed star.

Fig. 157.—The seven parted flower form can be made from this star as a base, using the illustrations of the five-pointed star. Nature, however, gives us very few flowers of that kind. The Clematis and Anemone are sometimes found with seven petals, and sometimes with more.

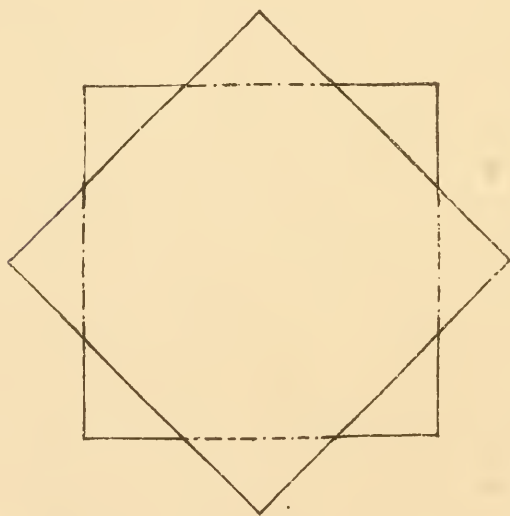


Fig. 158.

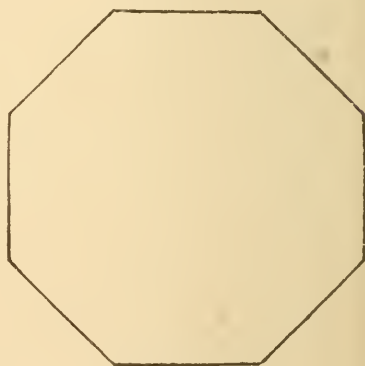


Fig. 159.

Fig. 159.—There are two methods of developing the octagon. First method: Place one square obliquely across another of equal size having the eight projecting corners equal.

Fig. 158.—Fold down the corners of one square along the edge of the other square. Cut on the folds, thus completing an octagon.

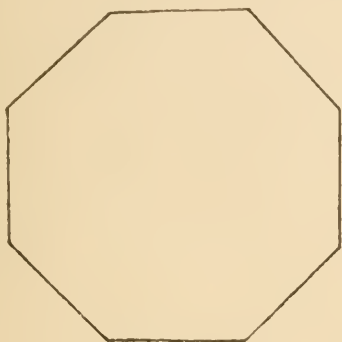


Fig. 160.

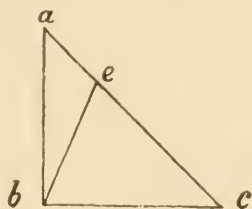


Fig. 161.

Fig. 160.—Second method: Fold a square on its diameters and diagonals as for the four-pointed star. From the center of the square “c”, which is one of the acute angles of the right angle triangle, measure off the length of one of the short-folded edges “a b” or “a c”, Fig. 161, upon the long-folded edge of the triangle. Care must be taken to measure from the angle formed by folds meeting and not where the edge is the long fold and the other the loose edges of the square. Cut from this point “e” to the end of the short edges “b”.

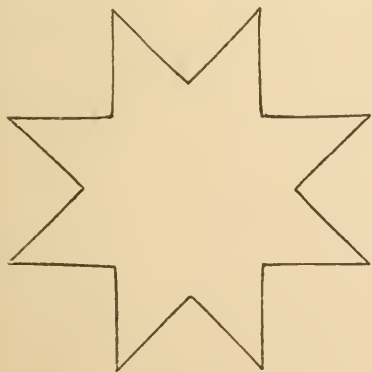


Fig. 162.

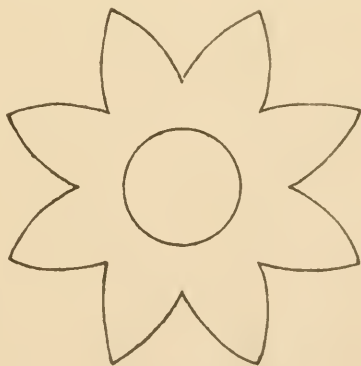


Fig. 163.

Fig. 162.—Fold for the octagon, using the second method, and follow the directions for cutting the previous stars.

Fig. 163.—Cut the eight-pointed star and cut the curve of the previous flower forms.



Fig. 164.



Fig. 165.



Fig. 166.

Figs. 164, 165, and 166.—To cut a bi-symmetry unit fold the long diameter of an oblong or of a square, if the unit need to be very broad. Keeping the diameter for the middle of the unit, sketch one half of the desired form, or cut without sketching, if skill has been gained sufficient for that method. The whole unit is cut at the same time and both sides are alike.

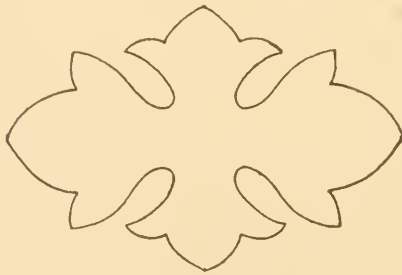


Fig. 167.

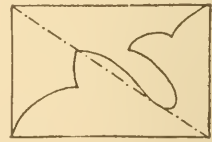


Fig. 168.

Fig. 167.—To make a design in an oblong, fold an oblong on its diameters and one diagonal, opening after each fold. Fold the long diameter, next the short diameter, and we have a small oblong showing one diagonal. This diagonal divides the space, indicating the part to be filled by each unit. Sketch the half of one unit on the long diameter and of the other unit on the short diameter, as in Fig. 168. Cut out and the design is obtained.



Fig. 169.



Fig. 170.



Fig. 171.



Fig. 172.

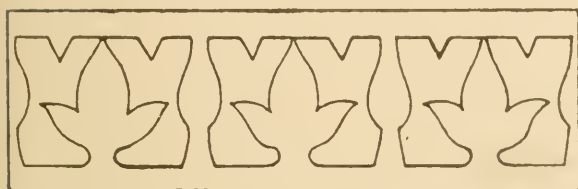


Fig. 173.



Fig. 174.

Figs. 169, 171 and 173.—Borders may be cut very easily, but it is better not to cut more than three or four units of the border at once, as too many thicknesses prevent uniform size when cut. Determine the size of the unit and take a strip of paper four times as long and as much wider as the width of the bands at top and bottom will require.

Fold the paper in quarters, for this gives four units, and then fold the quarters again in halves. This last fold is to be the center of the unit. Sketch one-half the unit as illustrated in either Figs. 170, 172 or 174, and cut on the lines drawn.



Fig. 175.

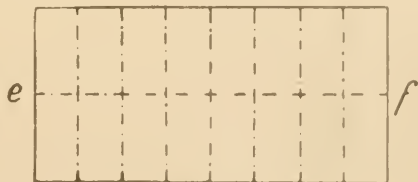


Fig. 176.

A border which is sometimes called a ladder. These borders are often used in tiled or inlaid floors. A long border cannot

easily cut because of the many thicknesses of paper to cut through, which will cause unevenness in size and outline, if attempted by children. Three or four units may be cut at one time and tracings made from that length.

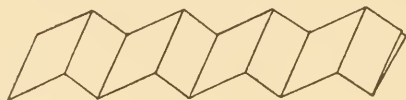


Fig. 177.



Fig. 178.

Fig. 175.—Take an oblong piece of paper as wide as the required border and three or four times as long as the width of one of the units, which in this case is to be an irregular hexagon. Fold the oblong on the dotted line, as in Fig. 176. This gives twice as many oblongs as there are to be units, as in Fig. 179. Cut off a right-angle triangle from the upper corner, as shown by the oblique line in Fig. 178. Care must be taken that the cut is at the top, which will show the edges of the paper, not the folded edge, or the original diameter. When opened Fig. 175 is obtained.

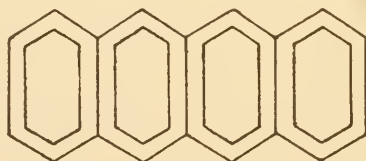


Fig. 179.



Fig. 180.

Fig. 179.—Make all folds as for Fig. 175 and cut the lines as shown in Fig. 180.

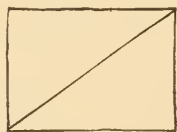


Fig. 181.

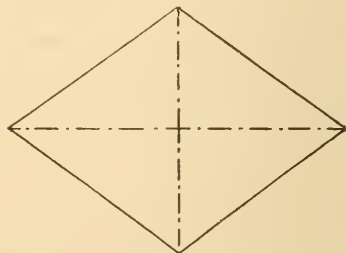


Fig. 182.

Fig. 182.—Fold an oblong on both diameters and cut diagon-

ally across from the end of one to the other, as in Fig. 181, thus forming a rhombus.



Fig. 183.

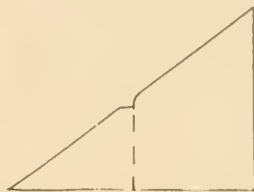


Fig. 184.

Fig. 183.—Fold the two obtuse corners of the rhombus together and then the two acute corners obtaining a right-angle triangle. Place the sharpest corner on the right-angle and crease the fold. This fold bisects the second longest side. Open this fold on the longest side, cut out a corner straight horizontally towards the sharp corner and curved outward and upward towards the other acute corner, as shown in Fig. 184. Open. Fold down the sides at the cut, then fold up the lower part and we have the envelope.

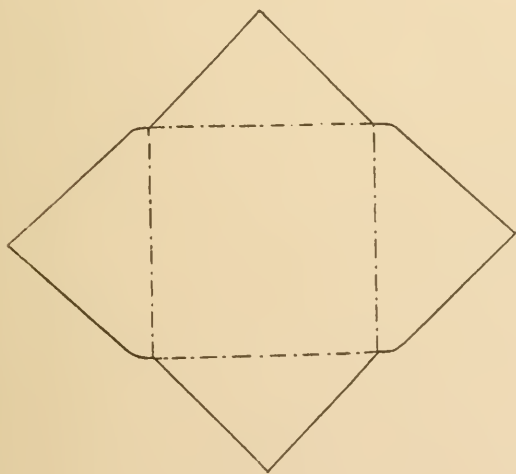


Fig. 185.



Fig. 186.

Fig. 185.—To make a square envelope fold a square on both diagonals and keep them folded. Bisect the side of the triangle

formed by the four edges of the square. From one acute corner cut on a line parallel with the edges of the square half-way across and one-quarter inch below the edge. Curve the cutting out gently to the edge of the triangle, as in Fig. 186. Fold sides first and then the bottom and top laps.

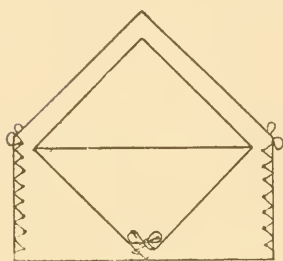


Fig. 187.

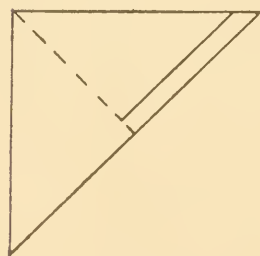


Fig. 188.

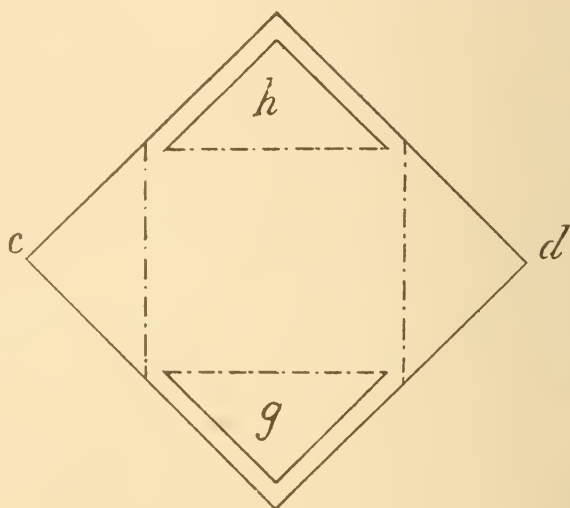


Fig. 189.

Fig. 187.—To make a hand bag, fold as for the square envelope and fold the triangle again in halves. Open this last fold and cut as for the square envelope, stopping when the last-made fold is reached. This will be half-way across the long side of the triangle as shown by dotted line, Fig. 188. Open and fold down towards the center the inner triangles “h” and “g”, Fig. 189, made by the cut. Turn the paper and fold the uncut corners “d” and “c”, Fig. 189, to the center. These folds make the sides of the bag. Fold these in the middle, or on what was the diagonal of the square. The side can be joined by sewing, lacing or by gumming. The corners folded outside can also be fastened with a bow of ribbon or fancy button.

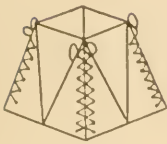


Fig. 190.

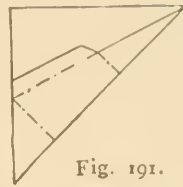


Fig. 191.

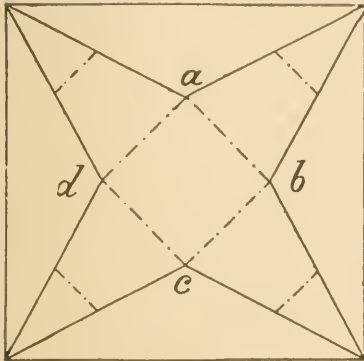


Fig. 192.

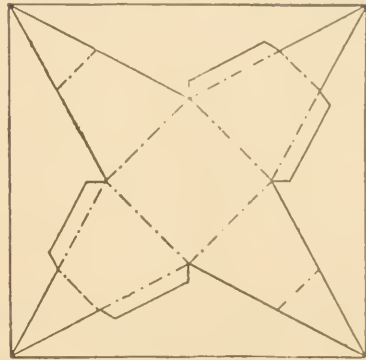


Fig. 193.

Fig. 190.—To make a basket, fold a square on diameters and diagonals, as in the folding for the five-pointed star, and cut the star. Fold back each point of the star at its base as shown in Fig. 192 by the dotted lines “ab”, “ad”, “bc”, “cd”. Bend or fold back less than one-half of the points, on upper dotted lines. Join the edges between the folds in the points by lacing. If the sides are to be gummed follow the cuttings in Fig. 191 as follows: Fold the diameters and diagonals of the square, leaving the form in a right-angle triangle. Draw the line for the star from the corner to the point of bisection in one short side, i. e., the side consisting of one double-folded edge. Draw another line parallel to this line and one-quarter inch outside of it, nearly two thirds of its length from the folded edge. Connect the two lines. Cut as shown by oblique line in Fig. 191. Open one half of the paper and cut off the added laps on each side of two opposite points of the star. (See Fig. 193.) Or open the star and cut off a lap on one side of each point, leaving a lap on the adjacent side of the next point. Fasten the sides by gumming the laps over on the next points, after folding the points on the dotted lines as before.

These baskets can be made of cardboard or celluloid. If of celluloid they are prettier to curve the end of the points outward by holding the point wrapped around a warm iron rod, as a hot water pipe. They will then permanently retain that curved shape, and make pretty and useful baskets for the bureau or sewing table.

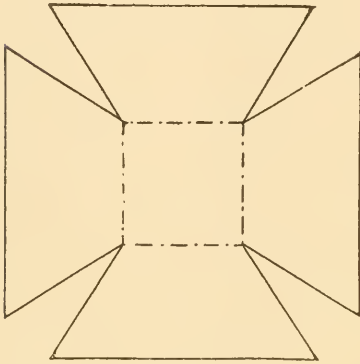


Fig. 194.

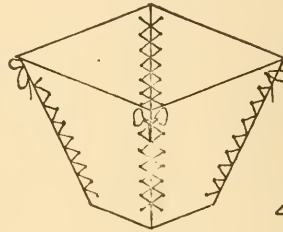


Fig. 195

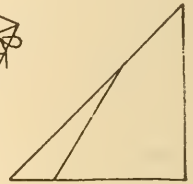


Fig. 196.

Fig. 195.—To make a basket from the Maltese cross fold a square for a Maltese cross, as in Fig. 187, and cut the cross. Fold back each arm of the cross, leaving a square for the bottom of the basket, as in Fig. 194. The sides can be gummed or laced, as given in directions for Fig. 190.

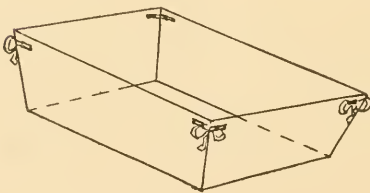


Fig. 197.

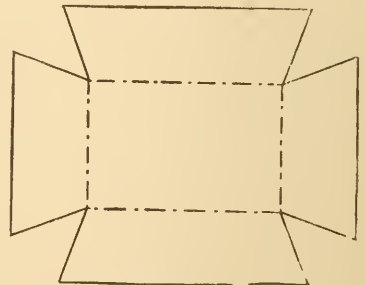


Fig. 198.

Fig. 197.—An oblong basket can be made from an oblong by varying the depths of cutting at the corners, as shown in Fig.

198. In all of this work when made of stronger material than paper, such as card board, celluloid, etc., the pattern should first be cut from paper and then carefully measured and drawn on the stronger material, and each side cut out separately. By using transparent celluloid or ivorine, painting a border of violets, daisies, buttercups, or wild roses, and cutting out the outer edge or row of petals, joining the sides at the corners with narrow ribbon the color of the flowers, and putting a soft pad of silk in the bottom very pretty Christmas gifts of jewel boxes can be made. The size of the base and heights of the side of the basket can be changed by cutting the arms of the cross differently. For instance, bisect the long folds of the triangle instead of trisecting as given in the directions for the cross. See Fig. 196.

If the basket be made from the oblong the short sides will be deeper than the long sides. These can be cut off to be equal in depth or left as they are. The same plan as the one based on the four-pointed star can be used with the five or six-pointed star and with equal ease.

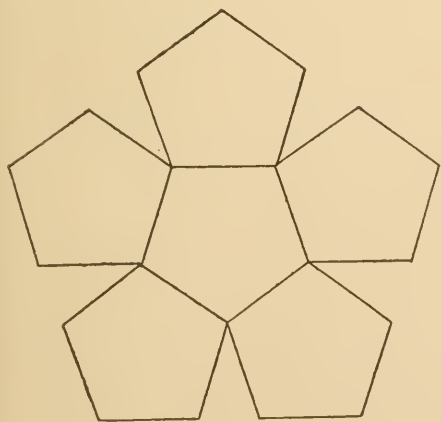


Fig. 199.

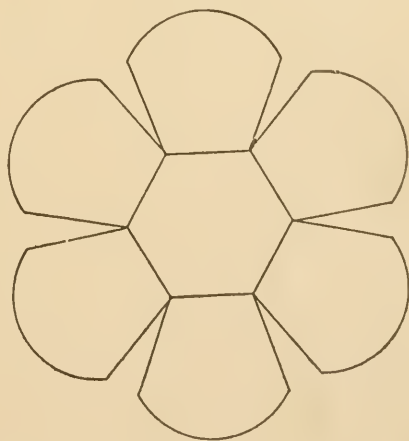


Fig. 200.

Figs. 199 and 200.—Cardcases based upon the pentagon or hexagon. These are easily made as follows : Cut six pentagons

of equal size. Arrange five around the extra one, as in Fig. 199, and trace around them for the pattern. Bend carefully where each joins the center one. Or cut each from cardboard, cover with any material desired, as silk, velvet or plush, and join by sewing or with ribbon. Using large pentagons convenient workbaskets can be made. If the hexagonal form is wished, cut seven hexagons of equal size and proceed as for the pentagon, using one hexagon for the bottom of the basket, as in Fig. 200. One half of each outer form can be curved in either.

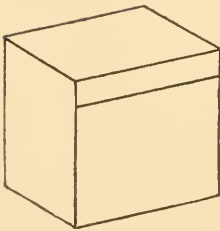


Fig. 201.

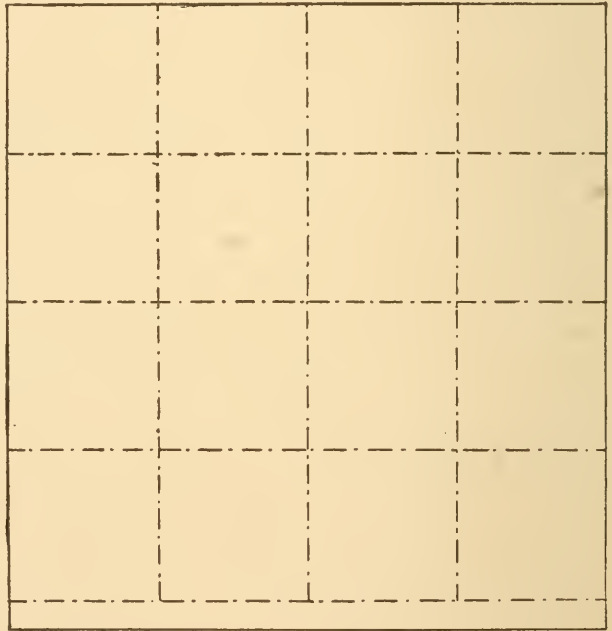


Fig. 202.

Fig. 201.—To fold the Cube. Use the second method given for folding a square from an oblong, but do not cut off the square, simply fold it. Add a lap nearly $\frac{1}{2}$ -inch wide, as in Fig. 202, to the square, and cut off the remainder of the oblong.

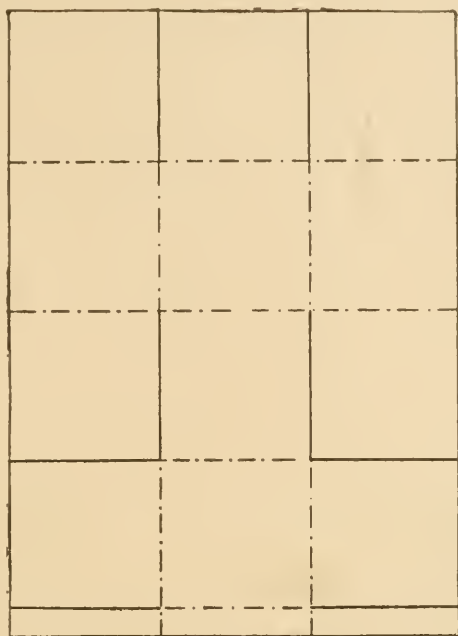


Fig. 203.

Keep the lap folded back and do not consider it in the directions treating the square as if without it. Place the square with the lap folded under, calling the fold edge the base of the square.

Dictation : Fold top edge of square to bottom of lower edge. Crease and open. Fold top and lower edges to the center, crease and open. The square now shows four oblongs. Fold the left edge over to the right edge, crease and open. Fold left and right edges to this center crease, and crease and open. The square is now folded into sixteen small squares, as in Fig. 202. Cut off the right-hand row of squares. This leaves an oblong three squares wide and four long. The lower row of three squares must have the extra $\frac{1}{2}$ -inch lap on the lower edge. See Fig 203. Cut on the right and left of the middle upper square. Cut on the top fold or edge of the lower right-hand square. Cut on the top fold or edge of the lower left-hand square. Cut the lap or lower edges of the same lower squares. Cut the right

and left-hand edges of the middle square in the third row from the top. See Fig. 203. Nothing has been cut off except the first row of four squares at the right, if the work has been correctly done. If the cube is not to be saved it can now be held together in perfect form without gumming or pinning as follows: Fig. 204 is as it appears after this dictated folding. Fold in the upper corner squares. Fold in the third squares on the right and left sides. Fold in the lower corner squares. Fold in the ends of the lap on the lower middle square and at bottom.

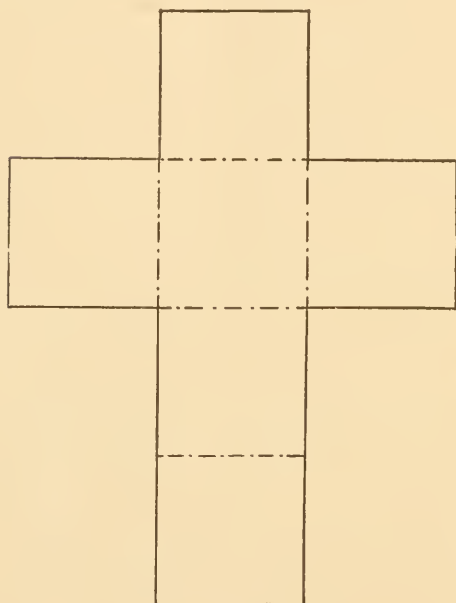


Fig. 204.

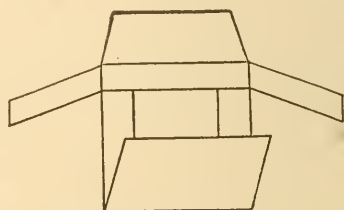


Fig. 205.

Now fold up the side, top and bottom squares, carefully slipping the side squares attached to the lower square inside of those attached to the top of the inside square. Slip the upper edge of the middle top square into the little case formed by the three folded laps on the lower square. See Fig. 205.

If the cube is desired for temporary use only this method of fastening is sufficient. If for permanent use the outside squares will need to be gummed at the edges, and in that case have all laps folded inside, showing the six faces only of the cube.

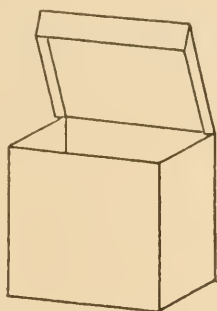


Fig. 206.

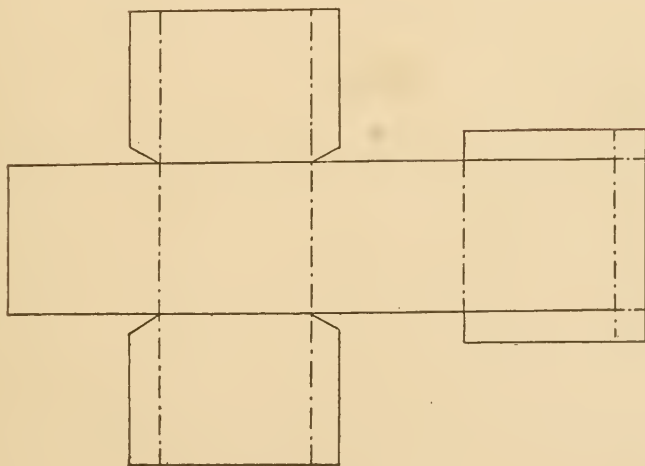


Fig. 207.

Fig. 206.—To fold a cubical box. Make all the folds shown in Figs. 202 and 203, and instead of leaving the whole squares for laps, leave only $\frac{1}{2}$ -inch of each. See Fig. 207. Join the laps on three sides of the middle bottom square, at the lower two corners by lapping and gumming. This is to be the cover of the box. Fasten by gumming the side squares to front and back squares by the laps, leaving what is now the cover loose, except where it joins the back of the box.

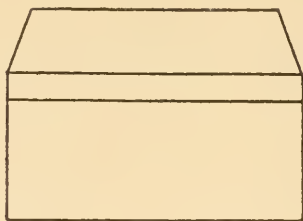


Fig. 208.

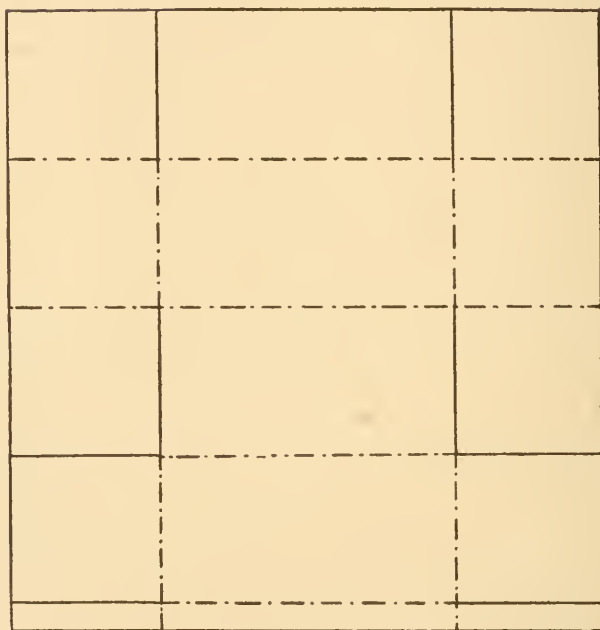


Fig. 209.

Fig. 208.—To fold the square prism from a square. Make the square from the oblong, retaining the added lap as for the cube, By a little care the vertical fold in the center, as seen in Fig. 202, for the cube can be omitted and the right and left sides folded down by quadrisecting sides, as in Fig. 209. Do not cut off any squares as for the cube, but cut as follows : Cut between the upper oblong and the square at its left and at its right. Cut between the lower corner squares and the laps on their lower edge. Cut between the top of the lower corner squares and the

square in third row from top. Cut between the third oblong from the top and the square at its left and the square at its right. See Fig. 207. The dotted lines represent folds, the full lines represent cut edges. Fold up the square prism in same manner as for the cube.

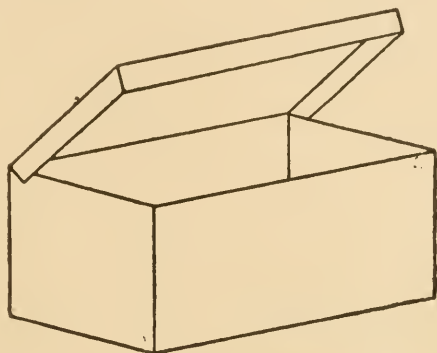


Fig. 210.

Fig. 210.—A box may be made which is based on the square prism; proceed as in the dictation for the cubical box leaving one-half inch laps for joining in place of full squares.

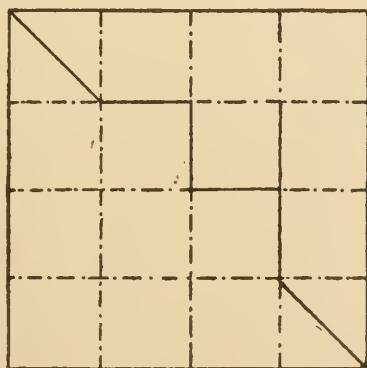


Fig. 211.

Fig. 212.—To fold a box in form of a square plinth from a square, which requires no gumming.

Fold a square in 64 small squares. Fold on the center folds making 4 squares each containing 16 squares. Begin at the

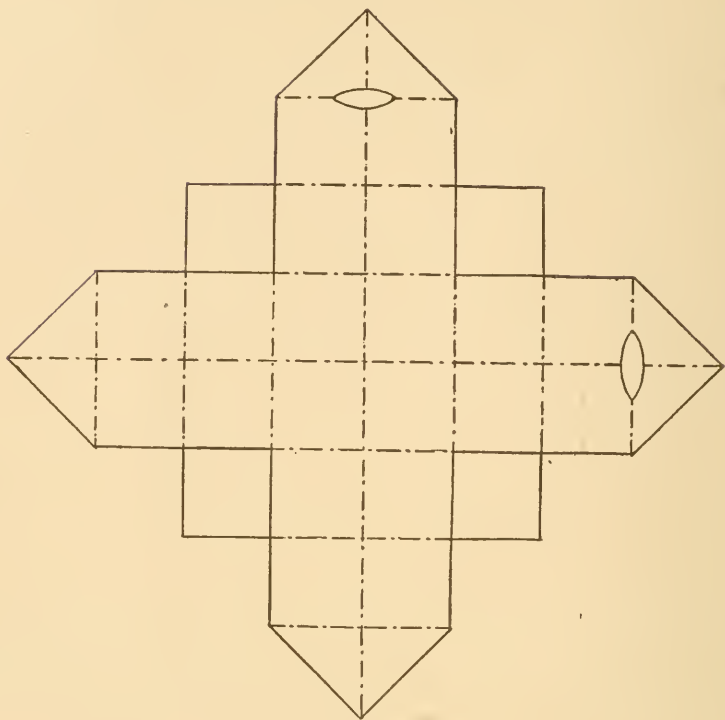


Fig. 212.

upper end of this fold, which is the vertical diameter of the large square and now forms the right side of the square 1-4 the original size. Cut obliquely across the upper right-hand square to its lower left-hand corner and cut off the remaining three squares in this row. Cut out the three squares at the left in the second and two in the third rows and from the upper right corner to the lower left corner of the first left-hand square in the fourth row. Fig. 211 shows this cut. Cut on the fold between the first square in third row and the one below it. Open and we have Fig. 212.

The four triangles are to form the covers and join the box together. Cut in one fourth of the base in the one at top and one side.

Cut the base on its two middle fourths, thus making a slit to receive the "tongue" on the opposite side. The bottom of

the box consists of the four center squares. The sides are one square high. Fold up the box and join by the tongues passing through the slit.

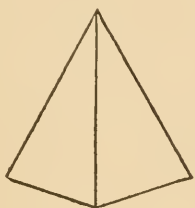


Fig. 213.

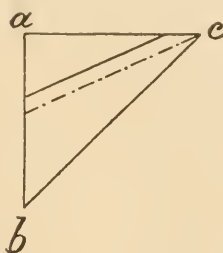


Fig. 214.

Fig. 213.—To make the square pyramid, fold the square on its diagonals and then on the diameters without opening. Draw a line for the cutting of the four-pointed star. Draw outside of this another line 1-4 inch from it, and cut on this last line, as

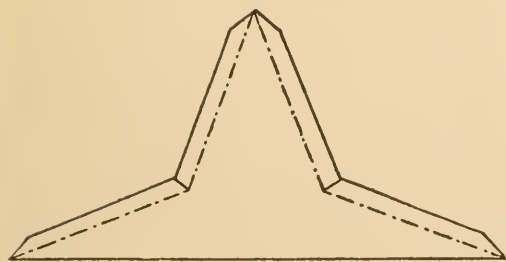


Fig. 215.

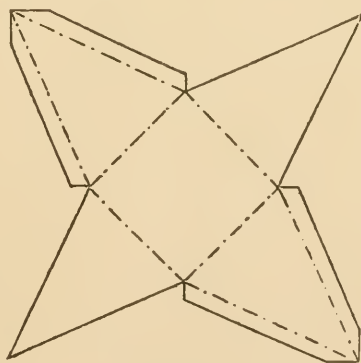


Fig. 216.

in Fig. 214. Open the paper until it is folded on only one diagonal, as in Fig. 215. Cut off the lap on the two open points that are folded together, open the star, which appears as in Fig. 216. Fold each point down on the dotted lines at the base of the point. This leaves the square base of the pyramid. Join the four sides by gumming the laps of the adjacent side. Gum all laps inside the pyramid.

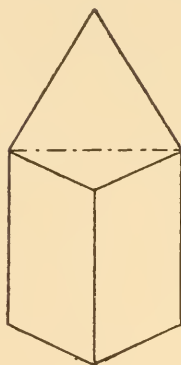


Fig. 217.

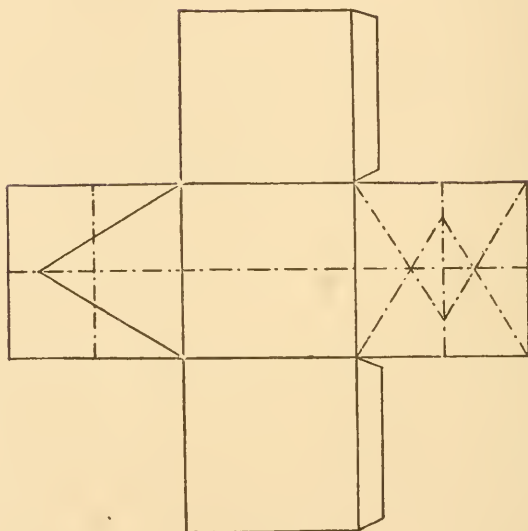


Fig. 218.

Fig. 217.—To make a triangular box, fold a square from an oblong and add the lap, as in the folding for the cube. Be sure that the added lap is on the lower edge of the square and the lower arm of the cross or lower square now has the lap at its base. Keep the lap folded back and fold the resulting square into nine small squares, as in the Greek cross, and the horizontal diameter. Cut out the upper and lower left-hand squares. See Fig. 218. Be careful that the upper and lower right-

hand squares have not been disturbed or cut off. Cut the lower edge of the right corner square, thus separating it from the right arm of the cross. Leave one-half inch attached to the upper middle square or arm of the cross, and cut off the remainder of the corner square. Cut the upper edge of the lower right corner square and leave one-half inch attached to the lower square or arm.

Now to fold the equilateral triangle for the top and bottom. The diameter folded now passes through the three squares from right to left. Fold the vertical diameter of the required triangle. Folding from the center square, fold once as for the equilateral triangle and turn this back again. Proceed in the same way, using the lower edge of the square for the base of the triangle. The two folds will cross the horizontal diameter near the outer edge, and where they cross is the apex of the triangle. Proceed the same way with the right arm. Cut out the triangle and fold the box.

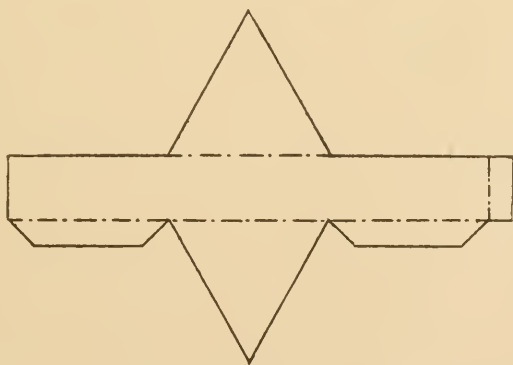


Fig 219.

Fig. 219.—A triangular box based on the plinth is made with more drawing for the pattern and less folding.

This requires an oblong $\frac{1}{2}$ -inch longer than the length of the three sides and as wide as the length of the two sides, plus the required depth. If the box is to be two inches high and four inches long, the oblong must be $12\frac{1}{2}$ inches by 10 inches.

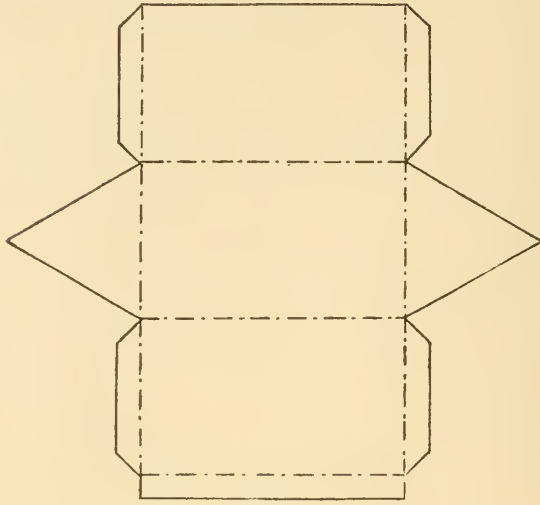


Fig. 220.

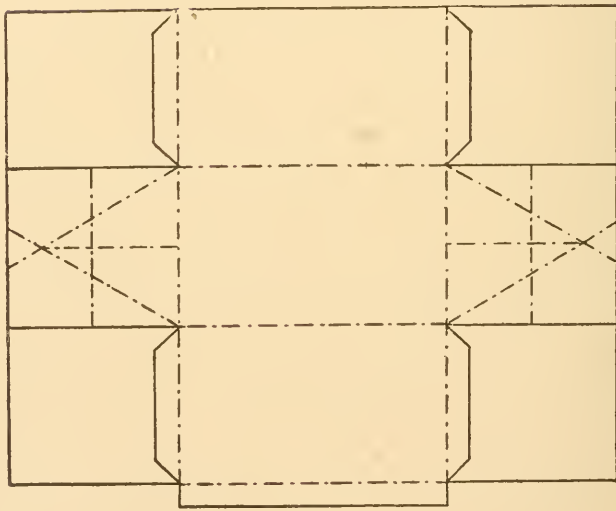


Fig. 221

Fig. 220.—To fold the equilateral triangle prism from a square, fold a square on its horizontal diameter. Fold the top and bottom edges of the square to this diameter and crease. Cut off all but $\frac{1}{2}$ -inch of the lower oblong thus obtained by folding the square. See Fig. 221.

Quadrisection the upper and lower edges of the remaining portion of the square and fold over one quarter of the length at right and left sides. The paper now is folded to have three squares at the right and three at the left sides, with three oblongs in the center, with a lap on the lower edge of the bottom oblong. Cut out the corner square, leaving one-half inch lap from them on the sides of the adjoining oblongs. See Figs. 214 and 221.

Also fold the middle square on each side to obtain the equilateral triangle for base and top of the prism according to the directions given for Fig. 218. When cut, the outline for the prism unfolded is obtained. See Fig. 220. Fold on the creases as represented by the dotted lines and fastened by gumming the edges over on the laps.

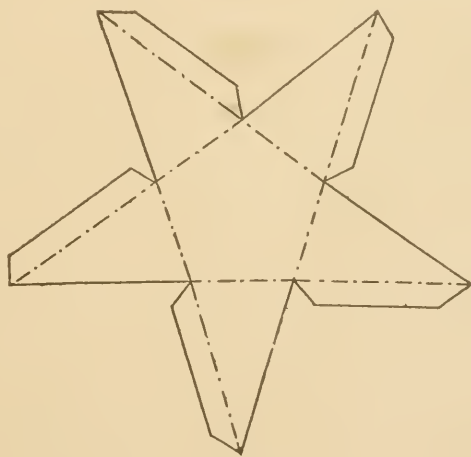


Fig. 222.

Fig. 222.—To make the Pentagonal pyramid cut the five-pointed star but make the points narrower and longer by cutting nearer the center. In this case the one lap must be cut on each point, or for convenience both may be cut at first and then every other one cut off. Fold the points on the dotted lines and join by the laps gummed inside the pyramid. In making the basket from the five-pointed star the joining is better done by lacing.

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